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American Anthropologist

NEW SERIES

VOL. 17 JANUARY–MARCH, 1915 NO. 1

THE PRINCIPLE OF THE SCREW IN THE TECHNIQUE OF THE ESKIMO

BY MORTEN P. PORSILD

IN a brief paper written in Danish, annexed to the report on his well-known expedition to the Scoresby Sound region of East Greenland, C. Ryder[1] states that bone arrowpoints from both coasts of Greenland in olden times were fastened to their wooden shafts by means of screw-bearing tangs. Later Thalbitzer saw similar points in the collections from the Swedish Nathorst expedition to East Greenland (p. 365), and in a recent paper (1, p. 162) I have given a few figures of such screw-bearing tenons of arrowpoints from West Greenland. When the manuscript of the paper last mentioned was sent from Greenland to Copenhagen for publication, I did not have access to several leading works by American writers on the culture of the Eskimo. Thanks to the courtesy of the Bureau of American Ethnology at Washington, the American Museum of Natural History of New York, and Prof. F. W. Putnam of Cambridge, Mass., a number of valuable books on the subject were kindly placed at my disposal, and I now learn that Dr Franz Boas also has touched on the problem of screws as an indigenous Eskimo invention.

As it sometimes has been said that primitive man was acquainted with only two ways of uniting two rigid objects endwise, namely, by nailing and by lashing, it is interesting to know that the

[1] Pages 310 ff., cited in the bibliography at the close of this article.

primitive Eskimo knew also the principle of the screw and that he invented the device himself. As the figures given by Ryder and Boas do not illustrate the best-developed forms of the device, and as I have had the opportunity of obtaining additional material since I wrote my first paper, it seems advisable to present a more detailed account of the subject. Besides the information gathered by myself, I have to thank the following gentlemen for the loan of specimens from their collections for examination: Mr J. Daugaard-Jensen, Director of the Administration of Greenland, Copenhagen, formerly Royal Inspector of North Greenland; Rev. H. Mortensen, Godhavn; Mr T. Hedegaard, manager of the trading post at Agto, near Egedesminde, and Mr N. Thron, manager of the colony of Holsteinborg.

I may be permitted first to present a translation of the passage of the author first cited, C. Ryder, which gives a full account of the occurrence of screws in the handicraft of the Eskimo of Greenland. He writes (pp. 310 ff.):

> On the tapering lower end of six of these arrowpoints are cut two knobs resembling fragments of a thread of a levogyrate screw. They are diametrically opposed, each of them making hardly half a turn. Such attempts to produce screws are found also on old arrowpoints from the west coast, sometimes two pairs over each other, and even in single cases a complete thread of a screw with several turns. The screws are nearly always left-hand ones, these being the easiest in making such an arrow, as the maker grasps the arrow with his left hand, the knife with his right, and holds the cutting edge of the knife slantingly toward the outer side of the arrow. By a revolving movement of the arrow, the knife cuts a left-hand screw. A left-handed person will grasp the arrow with the right hand, the knife with his left, and the screw thus becomes a right-hand one.

Types and Manufacture of the Screws

In the passage above cited Ryder gives an explanation of the Eskimo method of making screw-pointed objects, and I may state that the same method is followed at the present time by West Greenlanders. Of course arrows are no longer in use, but the butts of cleaning-rods and of ramrods for guns have often a set of spiral cuts or an elaborately worked screw, giving a better hold for the tow used in cleaning. The knife is held slantingly, according to the

pitch of the screw desired, and by simply revolving the rod outward, an accurate marking spiral cut is easily made. Starting from this first cut the several forms are carved (see fig. 1). Three principal types are distinguished, as follows:

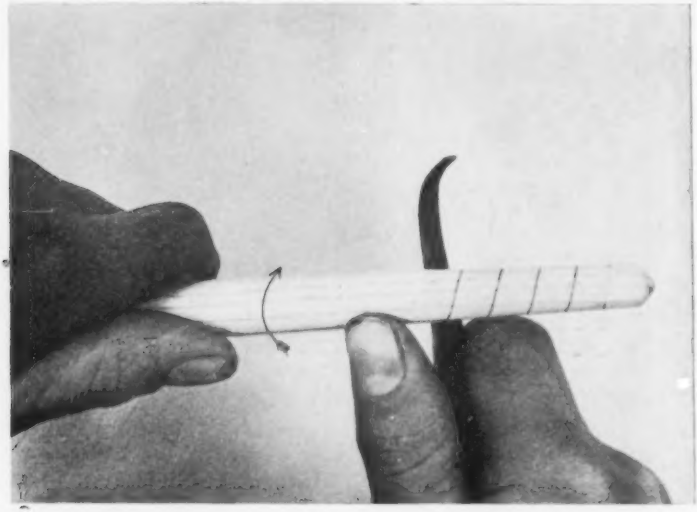


FIG. 1.—The first cut in Eskimo screw-making by a right-handed person.

I. The simplest type (fig. 2, *a*) is developed by cutting small chips from a little below the spire of the marking cut (fig. 1) downward to the next spire. This screw, provided with a sinew-lashing, will easily enter a hole in a rawhide or a mortise in soft wood, but will offer considerable resistance in being pulled out. This form is the most common one used in plugs for closing wounds, but it is also fairly common on arrowpoints.

II. A more elaborate type is shown in figure 2, *b*, which has a thread of several turns in high relief on the surface of the tenon. This form offers equal resistance to being pulled out or being thrust in. It is very common on arrowpoints.

III. The third and most elaborate type (fig. 2, *c*) is very

common on arrowpoints and seems to have the widest geographical distribution. Here are found one or two pairs of slanting projecting knobs, forming together parts of the thread of a screw. In studying arrows with such knobs, the knobs will always be found carved on the flanks of the piece of antler, where this material has the greatest strength, while the less resistant parts are cut off entirely. In former times the Eskimo doubtless realized the fact that a screw-

FIG. 2.—Types of Eskimo screws. *a*, The simplest type. *b*, A more elaborate type. *c*, The most elaborate type. (Exact size.)

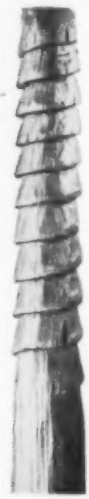


FIG. 3.—Butt of a cleaning-rod belonging to a left-handed hunter; Hunde Eiland, Disko bay. (Exact size.)

thread carved out of the weaker parts of the antler is of little use for holding the point in the shaft, and that a complete screw is more liable than the knobs to split the shaft.

I wish here to say that the terms "simple" and "elaborate" are used in a technological sense and not as suggesting a difference in the age of the types, as all occur here together; indeed the two forms appear in a single set of arrows deposited at a grave, both having been fashioned and used by the same individual.

ARROWPOINTS WITH SCREWS. (ONE-HALF SIZE)

The extreme point of the tenon, below the knobs or the screw-thread, is often, but not always, formed as a four-sided awl. This device is very useful when the point has become loosened, since, by simply twisting the arrowpoint, the awl and the screw will act together and force their way deeper into the shaft. This awl-shaped point is extremely common on arrows of the third type, with knobs alone, but may occur also on arrows of the other types.

As already stated by Ryder, nearly all Eskimo screws are what may be termed left-handed, a fact directly attributable to the method of making and because most persons are right-handed, as above explained. A screw made by a left-handed person will of necessity be what we call a right-handed one. As an example there is illustrated (fig. 3) the butt of a cleaning rod belonging to a left-handed hunter of my acquaintance.

DESCRIPTION OF SOME ARROWPOINTS WITH SCREWS (PLATES I–III)

No. 1. Igdlorssuit, Ubekendt Eiland, 71° 13′ N. lat. A rather short but very strong and heavy point; butt, cutting edges, and barb well ground and polished, and still very sharp. The tenon with a complete thread of about 5 twists (type II), cut with a knife, the markings of which are still visible. The specimen is not weathered. Length 22 cm., weight 22 grams.

No. 2. Similar, from the same place. Dark brown, with two barbs on the same side. Screw of type I, with awl-shaped point. In this example also the cuts are conspicuous. Length 23 cm., weight 17 gr.

Nos. 3–4. Igdlorssuit. Two small, light points, belonging to the same set and evidently made by the same person. Both have long cutting edges; No. 3 with two barbs on the same side, No. 4 with two barbs opposed. Tenons with one pair of slanting knobs and well-formed awl. No. 3, 18 cm., 10 gr.; No. 4, 20 cm., 10 gr.

No. 5. Uvkusigssat Fjord, about 72°. Somewhat weathered point, the edges no longer being sharp. Tenon with screw probably of type I. Slight traces of knife cuts are still conspicuous. 24 cm., 20 gr.

No. 6. Tartusaq or Svartenhuk Peninsula, 71° 25′. A strong, well made, unweathered point, with one lateral barb and long cutting

edges. Tenon large, with one pair of knobs and distinct awl-shaped point. 28 cm., 25 gr. This point was found with the shaft in fairly good condition. Plate III, 31, shows its upper end with the sinew-lashings. The shaft is of driftwood, but very dry; length 40 cm., weight 15 gr.

No. 7. Disko Fjord, Disko Island, 69° 40′. Well pointed, but without cutting edges or barbs, and probably not an arrow but the terminal point of a bird dart or of a salmon spear. Tenon with two pairs of knobs and a small awl. 15 cm.

No. 8. Disko Fjord. A very small but finely worked ivory point, with one lateral barb and a riveted iron blade. Tenon with spiral twists. Length 8 cm., weight hardly 2 gr.

No. 9. Well made and well preserved point found on Kronprinsens Eiland in Disko bay. Tenon well formed, with screw of type II and with a short awl. 23 cm., 20 gr.

No. 10. Kronprinsens Eiland. Fragment of an arrowpoint with tenon resembling that of the last, but without awl.

No. 11. Hunde Eiland, Disko bay. Arrowpoint with upper end of unusual form, long cutting edges, and one lateral barb. Tenon with screw of type II, with about six revolutions. Length 25 cm. As the middle part is much weathered, the weight is not given.

No. 12. Egedesminde. Fragment with screw of type II.

No. 13. Hunde Eiland. With long cutting edges, but without barbs. Tenon with screw of type I. 27 cm., somewhat weathered.

No. 14. Hunde Eiland. With long cutting edges and two small opposed barbs. Much weathered; the basal parts, however, are well preserved, showing screw of type I, over the uppermost twist of which are seen numerous small cuts for roughening the tenon (not visible in the photograph). Awl-shaped point, broken off. 27 cm.

No. 15. Hunde Eiland. Short, somewhat weathered point with two opposed barbs. Tenon with remains of a screw and with a well preserved awl.

No. 16. Hunde Eiland. Rather clumsy, not well made point, with cut for an iron blade. Tenon short, with screw poorly made. 10 cm., 14 gr.

ARROWPOINTS WITH SCREWS. (ONE-HALF SIZE)

No. 17. Environs of Egedesminde. *A pangaligtoq*, or automatically working arrowpoint for deer-hunting (cf. Porsild, II, and III, p. 620. It seems that arrows of this peculiar use have been known also to the Eskimo of Alaska; cf. Murdoch, p. 205). Seven lateral barbs, still very sharp. The upper cutting point was probably originally longer, but was broken and resharpened. Tenon with screw of type I and with awl. 27 cm.

No. 18. Egedesminde. A rather well-preserved *pangaligtoq* of fine workmanship, with four lateral barbs and with terminal groove for an iron blade. The point was split by the stroke and repaired with a sinew lashing through two holes with uniting grooves. Tenon with elaborate screw of type II and with indistinct awl. Length 29 cm.; weight without iron blade, 21 gr.

Nos. 19–24. Egedesminde. Six arrowpoints found together at a grave and probably made by the same person. All rather weathered.

No. 19. Two cutting edges and two lateral barbs on the same side. Tenon with distinct screw, transition between types I and II, and with short awl. 25 cm.

No. 20 (not figured). Fragment with nearly identical tenon.

No. 21 (not figured). Point with long cutting edges and two opposed barbs. Tenon with slanting knobs. 20 cm.

No. 22. Similar specimen, but with two barbs on the same side. Tenon with one pair of knobs and distinct awl. 17 cm.

No. 23. With two opposed barbs. Tenon with two pairs of knobs and with awl. 20 cm.

No. 24 (not figured). Similar to the last, but with a riveted iron blade and hence no cutting edges. Tenon with knobs and awl. 17 cm.

Although the points of this set of six arrowpoints differ in the arrangement of the barbs as well as in the form of the tenons, there are some features of the workmanship which suggest that the whole set was made by the same person. The specimens with two lateral barbs on the same side show a characteristic flattening of the flank between the barbs that seems to be due solely to a whim of the maker and hardly had any intended purpose.

Nos. 25–28. Kangatsiaq, District of Egedesminde. A set of four very characteristic arrowpoints, evidently made by the same

person. The remarkable features are the slender stems, the great distance between the lateral barbs, and the riveted iron blades of which traces are still preserved. Probably they were a sort of *pangaligtoq*. In all the specimens the tenon is rather short, with a screw of type II consisting of about 2½ revolutions, without awl.

	Length without blade	Distance between barbs	Weight without blade
No. 25 (not figured)	30 cm.	9 cm.	20 gr.
No. 26	25 "	8 "	15 "
No. 27	29 "	5 "	20 "
No. 28	31 "	10 "	20 "

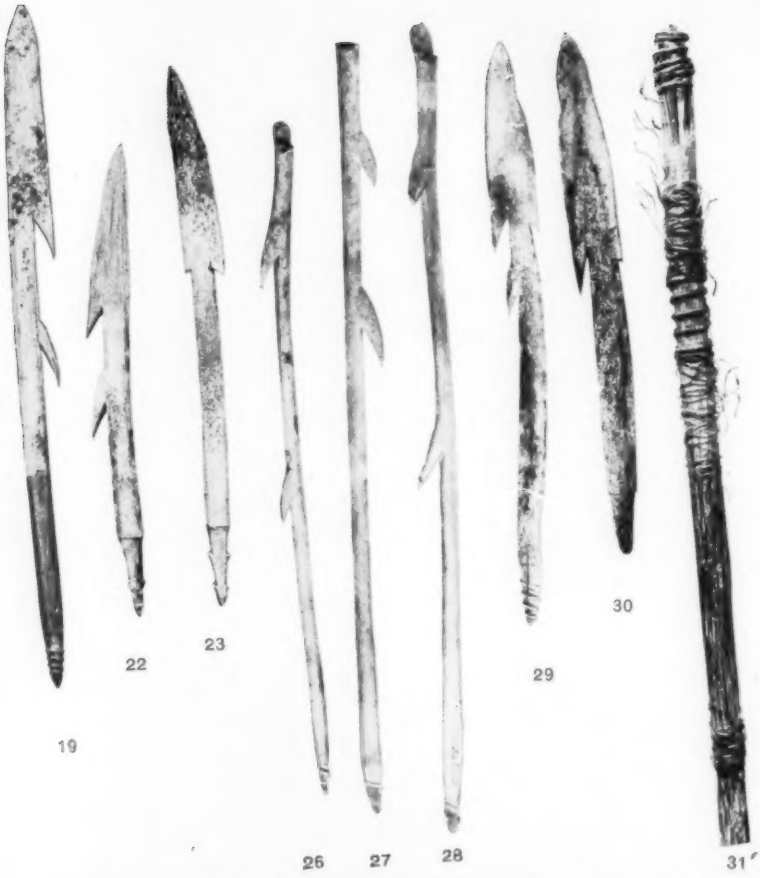
No. 29. Kangamiut, District of Sukkertoppen, 65° 50′. A heavy point with two lateral barbs on one side, a small one on the other. Tenon with well-worked screw of type II. Rather weathered. 22 cm., 15 (?) gr.

No. 30. Kangamiut. A short, stout, rather well preserved point with one large lateral barb on one side and a very small one on the other. Tenon with two pairs of knobs. 20 cm., 20 gr.

The thirty arrowpoints described above, the tiny No. 8 alone excepted, are made of reindeer antler, and most of them, at least all the larger ones, have been used in caribou hunting. They are nearly all more or less curved, a result of long exposure to the weather. If kept dry, objects of antler will last for centuries in the arctic climate, as is ordinarily the case with arrowpoints stuck in crevices amongst the stones of a grave, where rain and melting snow soon evaporate. But specimens embedded in tufts of moss or accidentally lost on ground covered with vegetation are much more readily affected by the weather, partially through action of organisms, and will soon acquire the appearance of greater age than better preserved specimens show.

Geographical Distribution of the Screw

A. West Greenland. Although the material from which arrowpoints of the west coast are made is rather accidental, it still ranges from about 65° N. lat. to about 72° N. lat.: that is to say, it covers the principal caribou districts of the colonized part of the west coast, the district of Godthaab and Frederikshaab, 62°–65°



ARROWPOINTS WITH SCREWS, AND UPPER END OF ARROWSHAFT. (ONE-HALF SIZE)

N. lat., excepted. From this district, however, I have also seen specimens (not now at hand), and I do not doubt that arrowpoints with screw-bearing tenons have been very common along the entire coast of Danish West Greenland. From Ryder (loc. cit., p. 310) and Thalbitzer (loc. cit., p. 365) we also learn that numerous points of this kind are preserved in the museums of Copenhagen and Stockholm, perhaps also elsewhere. A number of them are also probably still preserved in their wooden shafts, the screw-bearing tenons thus being concealed.

B. East Greenland. From the Scoresby Sound region six points with screws are mentioned by Ryder (loc. cit.). From the same region and from Franz Josef fjord the Nathorst expedition brought seven points with screws, according to Thalbitzer (loc. cit., p. 365).

C. Central Tribes. A point with slanting knobs is figured and described by Boas (III, p. 397, fig. 193, *b*) from Frozen strait. Probably also the small point figured by the same author (II, p. 83, fig. 116, *a*) from Boothia Felix has traces of slanting knobs on its tenon.

D. Alaskan Tribes. In the memoirs by Murdoch and Nelson I find neither description nor illustrations of screw-bearing tenons of arrowpoints, but Boas says distinctly (III, p. 398) that "points of this kind are found frequently on Alaskan specimens."

Greenland Arrowpoints without Screws

In various papers Boas has stated that the bone arrowpoints of the tribes of the Central Eskimo ordinarily are beveled and attached to the beveled upper end of the shaft with sinew lashing, in contradistinction to the arrows of the western tribes, which usually have tapering points fitted in mortises. It is interesting to note that the first kind occurs also in Greenland, although the second is far more common. In his paper (loc. cit., p. 366, pl. XVI, fig. 8) Thalbitzer describes and figures a point with one lateral barb and with a slit for a blade but without nail-hole. The author has some doubt about the purpose of this object, regarding it as either an arrow or a point for a bird dart or a salmon spear. According to my view it is the point of an arrow which was provided with a stone blade, hence

the thickening of the upper butt for strengthening. The tang of this specimen, as well as of a similar one found by Thalbitzer (loc. cit., fig. 82), seems to have been lashed to the shaft. A third

FIG. 4.—*a*, Arrowpoints with beveled tangs; from Iginiarfik, Egedesminde, west Greenland. *b*, Tangs of the preceding. (One-half size.)

specimen, collected by Nathorst in northeastern Greenland, is also mentioned by Thalbitzer (p. 369). These specimens are somewhat weathered, but the illustrations are not sufficiently clear to make it

certain how the attachment was effected. But I have in my collection two examples from a grave near Iginiarfik, in the District of Egedesminde, which show that both the purpose of the object and the method of attachment are beyond question (see fig. 4). One of these has a long point with two cutting edges, two opposed lateral barbs, and a third secondary one; the total length is 32 cm. The other is shorter (20 cm.), with two unopposed barbs, and probably has had an inserted blade, as the cutting edges are not developed. The tangs of both specimens are identical, being beveled and of bayonet shape, evidently intended to be fixed by lashing to a correspondingly formed butt of the shaft. Both specimens are much weathered and may perhaps be of greater age than most of the others herein described. But it may be repeated that the weathering alone is no sign of antiquity, since several of the screw-bearing specimens are as greatly weathered, and indeed sometimes half is totally weathered away, while the other part is as fresh as if it had been made a year ago. These may be the product of the personal style of their maker.

Plugs and other Implements with Screws

The occurrence of screw-like cuts on modern cleaning-rods for guns has already been mentioned (see fig. 3).

Plugs for closing wounds in seal-hides before towing have been in general use throughout the western coast of Greenland, but they have so long ceased to be made about Disko bay that many hunters are not familiar with them at all, although in house ruins and on beaches one may still find old specimens more or less decayed. At least in the southernmost parts of Greenland such plugs are still in use, every canoeman having a bundle of various sizes lying under the bladder on the aftdeck of his kayak. They are generally of wood and are more or less wedge-shaped according to the form of the wound made by the harpoon or the lance. The purpose of the plugs is not only to prevent loss of blood, but particularly to make it possible to inflate the seal's body in order that it may float, thus making towing easier. Inflation is accomplished in the simplest way, the hunter blowing into the wound or the anus of the seal.

There are two kinds of wooden plugs. One of these has a number

of transverse parallel grooves with oblique edges. This form is thrust into the wound until one of the grooves exactly closes it. To pull the plug out, the wound must be slightly enlarged. (See fig. 5, *a*; Boas, II, fig. 18, has the same form from the Central tribes.)

a *b*

FIG. 5.—Types of wooden plugs for closing wounds. (Models; exact size.)

a *b*

FIG. 6.—*a*, Old wooden plug for closing wounds; from Hunde Eiland. *b*, Probably a plug for closing wounds; made of whale bone; from Hunde Eiland. (Exact size.)

The other kind has a groove cut spirally, resembling the arrow screws of type I. This kind is screwed into the wound until it is filled, and is easily unscrewed without enlarging the wound (fig. 5, *b*). The same form is also known to the Central tribes (cf. Boas, I, fig. 402). It is readily seen that a screw-like cut in a flat object will not prove effective in a hard substance, such as wood; but in soft materials, like rawhide, a flat screw will work as well as a cylindrical one. Hence the tenons of arrows are nearly always cylindrical in section, whereas the plugs are usually elliptical.

Figure 6, *a*, illustrates an old wooden plug from Hunde Eiland in Disko bay, with grooves on one side only. It is not well preserved.

Figure 6, *b*, is a stout piece of whale's bone in which a fine screw of type II is carved. As the piece is too large for an arrowpoint, it may have served as a plug.

Figure 7, *a*, shows a wooden implement the use of which is uncertain. The part with the elaborately cut screw is elliptical in section; the other part has a cutting edge reaching nearly halfway up. The upper point is cylindrical. Total length 28 cm. Manîtsoq island, near Egedesminde.

Figure 7, *b*, shows an odd piece of somewhat rotted wood, on which has been cut a very well made screw of type I. The piece is not of driftwood, but of a native willow (*Salix* sp., probably *S. glauca*). It seems never to have been straight, and as the wood of this species of willow is soft and of little strength even when new, I believe the object was never put to practical use, but was fashioned merely as a pastime and then thrown away. Total length 25 cm. House ruins on Manîtsoq, near Egedesminde.

FIG. 7.—*a*. Wooden implement of uncertain use; from Manîtsoq, Egedesminde. *b*, Carved willow stem, probably not for practical use; from Manîtsoq. (One-half size.)

REMARKS ON LINGUISTICS

Although the technique of the Eskimo has developed the principle of the screw, his language—at least the dialect of Greenland—has no vocable expressing the common concept of a screw. From the verb *qipivâ*, 'he twists it,' is derived *qipineq* or *qivneq*; 'a winding,' 'a twist,' 'a spire,' whence *qivnilik*, 'provided with twists' (*qivneq*

and the affix *-lik*, 'having'). As the term "screw," together with its numerous compounds and combinations, cannot be translated literally, the Eskimo of Greenland either invents new terms for the several screw-bearing objects introduced into Greenland or else paraphrases the Danish terms in accordance with his conception. A screw to be fixed in wood or metal is called *kikiaq qivnilik*, 'a nail with twists'; but a screw used to clamp two things together becomes *sukaterut qivnilik*. The same combination, *sukaterut qivnilik*, also signifies 'a screw's nut,' because *sukaterut* is 'a means for straightening or tightening something'—for instance, the string used to tighten the hood of the waterproof jacket around the face is also correctly called *sukaterut*. A twisted string may be called *qivnilik* in contradistinction to a braided one, which is known as *perdlainilik*. Other implements introduced with their Danish terms consisting of a compound of the word 'screw,' the Greenlander has translated in his own way; for example, a vise, Danish *skruestik*, is translated *pusugutit*, from *pusûk*, 'the first and second fingers of the hand together.' To the Greenlander the jaws of a vise are the essential acting parts, not the screw which moves them. *Pusugutit* is therefore also the correct translation of 'forceps,' 'nippers.'

Is the Eskimo Screw an Aboriginal Invention?

The fact that screw-bearing implements are so frequently found in house ruins and graves of West Greenland leads naturally to the question, Is the screw an aboriginal invention or was it suggested by objects of European provenance? If the screw were known only in that part of the Eskimo region, a decisive answer would not be easy. The great bulk of old implements from West Greenland in the collection here treated, as well as in the more numerous examples in the principal museums of the world, were not gathered by scientific persons, but by natives who sold them to collectors; hence we are almost totally ignorant regarding the condition and age of the graves or the ruins in which they were found. The phrase "very old" in the language of the natives may mean half a century or a dozen centuries. But even in undisturbed ruins or graves we have no reliable basis for estimating the age of these objects. An interesting attempt in this direction has recently been made by C. B.

Thostrup,[1] who distinguishes three different periods of settlement based on the condition of the ruins of winter houses, namely: (1) The oldest winter houses are indicated only by a slight elevation of the ground where the walls formerly stood. (2) In the houses of the next period the roof has fallen in, and the walls, though still standing, are covered with earth and vegetation. (3) The houses of the latest period are but little demolished, and the passage and dwelling room are not yet filled up or overgrown with vegetation.

Nevertheless, there are some facts which lead to the belief that screw-bearing implements were made before the advent of Europeans into West Greenland. First, the bow and the arrow were the first aboriginal weapons to be discarded after the introduction of European objects, and arrows of bone with iron blades are remarkably scarce. Second, the custom of depositing objects in the graves was abolished immediately after the introduction of Christianity. Decisive evidence of the aboriginal character of screw-bearing objects, however, is their occurrence in far-off regions that have in no wise been influenced by the white man. Boas (III, p. 398) has already said that objects from Frozen strait exhibiting the screw are perhaps the best proof of the antiquity of the device; but the occurrence of numerous specimens from the east coast of Greenland, where the Eskimo were exterminated before the white man came to investigate their remains, speaks still more decisively for the antiquity and aboriginal character of the Eskimo screw.

Concluding Remarks

We thus reach the conclusion that the principle of the screw is an old and original invention of the Eskimo, executed by a method of his own. This method is still practised by the "civilized" West Greenlanders of our day, in analogy with other ancient processes originated at a time when only stone implements were available (cf. Porsild, I, chap. "How a stone-knife was used by the Eskimo").

Although the screw may have been familiar to the Eskimo for unnumbered centuries, our idea of the device as a physical entirety

[1] "Ethnographic Description of the Eskimo Settlements and Stone Remains in Northeast Greenland" (Danmark-Ekspeditionen til Grönlands Nordöstkyst, 1906–08, B. IV, no. 4, p. 335, *Meddelelser om Grönland*, XLIV, 1911).

has not been impressed on his mind in such manner as to cause him to originate a term synonymous with our own. He has noticed only the "twisted" surface, and even the modern Greenlander, who by practice has learned the working effect of a screw, has not invented a term strictly applicable to that function.

In consonance with nearly every recent contribution to the culture of the various Eskimo groups (Boas, Ryder, Thalbitzer, Porsild, and others), the observations here presented aim to show the remarkable unity of culture of that widespread people.

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LINGUISTIC POSITION OF THE TRIBES OF SOUTHERN TEXAS AND NORTHEASTERN MEXICO

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EXCEPTING its extreme northwestern and western extensions the territory included in the present state of Texas was anciently occupied by peoples of two sharply contrasted cultures. East of Trinity river and north of the latitude of Bidais creek, extending into northwestern Louisiana and southwestern Arkansas, were a group of tribes which had attained a very considerable stage of cultural development, reminding one in many respects of that reached along the lower Mississippi and eastward. These are the people we usually call Caddo from the designation of one of their principal divisions. South and west of them, however, in an area stretching from the southwestern corner of Louisiana and the western bank of the upper Trinity across the Rio Grande westward to about the site of Monclova, Coahuila, and southward almost to Panuco, were a vast number of small tribes of extremely low culture, so low, in fact, that it is to be doubted whether there is another area in North America which can compare with it in this respect. It is of these people that Cabeza de Vaca, early in the sixteenth century, gave such a depressing picture, and on many of the early maps we find the legend "wandering and cannibal peoples" printed here. The designation "cannibal" appears to have been applied in this region more justly than anywhere else in North America, and to the present day a remnant of one of these tribes, the Tonkawa, is known to other Indians as "man eaters," while the name which has survived as that of a linguistic stock in southwestern Louisiana and southeastern Texas, Atakapa, signifies the same thing in the tongue of the Choctaw from which it was borrowed. But while a low culture is not necessarily associated with cannibalism, in this particular region such was the case. All reports show us that the economic life, the social institutions, the habits and customs were

of the most primitive type, or perhaps I might better say that they were the least fused into those regional agreements or conventions upon which the phenomena which we call the tribe, the cultural area, and the nationality are built.

Along with this condition there seems to have gone a lack of ability on the part of the people to adapt themselves to civilization. Although they were not formidable antagonists, they could never be induced to submit to either the Spaniards or the Americans for a long period. It was not until two hundred years after the occupancy of Panuco that Escandon overcame the tribes of Tamaulipas, his conquest practically involving the destruction of the conquered, and the Texans on their side of the Rio Grande were finally incited by Karankawa depredations to overwhelm and destroy the remnant of that coastal people. The tribes farther inland were for a time missionized, but they frequently decamped, and it is probable that hope of protection against their northern enemies, the Apache and Comanche, had more influence in inducing them to settle about the missions than any real desire for civilization. At any rate they steadily declined in numbers until no considerable body of any of these Indians, unless we except the Tonkawa, now numbering fewer than forty-five, is known to be in existence. The adaptable French of Louisiana appear to have been the only Europeans in contact with these people who avoided any serious difficulties with them; but the Atakapa, the particular branch with which they had dealings, rapidly melted away, until today only a few descendants remain, confounded with the so-called "Red-bones" of Louisiana. Of all the Indians in this immense area only the few Atakapa and Tonkawa above mentioned, and possibly one or two remants in Tamaulipas, survive.

While, as we have said, these peoples all appear to have agreed closely in culture, or lack of culture, the fragments of their languages preserved to us show very considerable divergences, and on the basis of these fragments six or seven distinct linguistic stocks have been erected. These are the Atakapan between Opelousas and Vermilion bay, Louisiana, and Galveston bay, Texas; the Karankawan in Texas, from Galveston bay to Aransas bay; the Tonkawan

inland of the preceding between Trinity river and Cibolo creek; the Coahuiltecan, or Pakawan, from Cibolo creek to about Monclova, state of Coahuila, Mexico, reaching the Gulf of Mexico only at the mouths of the Nueces and Rio Grande; the Tamaulipecan, covering all except the northern, southern, and southwestern extremities of the state of Tamaulipas; the Janambrian, embracing the Janambres and Pisones of southwestern Tamaulipas; and probably the Olivean of the southern part of the same state.

The Olive, who give their name to the Olivean stock, were brought into this territory from somewhere in the interior of Texas by a Spanish expedition of the sixteenth century, were missionized, and afterward acted as a bulwark against the wilder tribes of the north. As it is not at all likely that this expedition penetrated beyond the territory under discussion, the natural inference is that the Olive belonged to the same group, but nothing of their language is known to have been preserved. The two other linguistic groups in Tamaulipas are given on the authority of Orozco y Berra and must stand until more documentary or other evidence is supplied. At present the only scrap of a strictly Tamaulipecan language available is a corrupted bit of Maratino, from the central part of the state near the Gulf. The results of an analysis of this will be given later.

The Coahuiltecan stock was originally based on a catechism of Bartolomé García, a Franciscan father in the San Antonio missions of southern Texas, and with the help of the notes accompanying his *Manual* and information from other sources collected by Professor Herbert E. Bolton we are enabled to outline the boundaries of the stock with considerable accuracy. In 1886 the late Dr A. S. Gatschet discovered a few Indians on the Mexican side of the Rio Grande who knew something of two of the former languages of that region, Comecrudo and Cotoname. These he considered dialects of the Coahuiltecan stock, and that assumption has persisted until today, although on Orozco y Berra's map we find the Comecrudo placed in the territory of the Tamaulipecan stock. The Karankawa material consists principally of a vocabulary collected by Gatschet from a Mrs Alice W. Oliver, a white woman, who had spent her

earlier years near the Texas coast and had acquired some knowledge of the speech of that people. It is limited in extent and probably somewhat corrupted. It was supplemented to a small degree by short vocabularies collected by him from two Tonkawa Indians. Although Atakapa is practically extinct as a spoken language, Gatschet was fortunate enough to visit the remnant of the tribe when it was still possible to secure material, and in consequence we have a fairly extensive vocabulary and several texts. He also collected a long vocabulary and a few texts from the Tonkawa. Tonkawa, however, is still spoken, although, as we have seen, by very few people, and work may yet be done upon it. So far as I am aware, this is the only language throughout the vast area we are considering of which such a thing may be said.

When a serious investigation has been made into the structure of Tonkawa and Atakapa we will have a better basis for comparison with the fragments of speech that have survived to us from farther south. From short preliminary studies of Atakapa and the language of García's *Manual* in connection with the fragments of Karankawa, Comecrudo, and Cotoname, I am of the opinion that neither the phonetic systems nor the structure of these varieties of speech differed very widely. All are vocalic, on the whole, clusters of two consonants being indeed fairly common, but not a dominant feature. Words and syllables often end in consonants, particularly *k*, *l*, *n*, *m*, and *s*. The other structural features known to me give indications that few striking differences will be found.

But, while waiting for such a study to be undertaken, the results of a lexical comparison made by the writer some years ago may be of interest, as it seems to bring out certain interesting facts. In preparation for this work the Comecrudo and Cotoname material collected by Gatschet has been carded, as has also the Coahuilteco of García's *Manual*, after the latter had been analyzed as thoroughly as possible. This was tabulated along with all that in Karankawa and all of the Tonkawa equivalents contained in Gatschet's Tonkawa vocabulary, and therefore includes practically all the cross comparisons now possible between the Coahuilteco, Comecrudo, Cotoname, Karankawa, and Tonkawa languages. All possible com-

parisons have also been made between the first four of these and Atakapa, but I have not attempted a complete comparison of Atakapa and Tonkawa.

The following table contains all of those words which seem, as a result of the above comparison, to bear some relation to each other, although exactness is unattainable in a matter of this kind, since some apparent resemblances no doubt have no real significance, while forms seemingly much wider apart are no doubt related. I suggest, however, that the errors in one direction may check off those in the other. But even though the total number of resemblances listed were actually greater than the facts warrant, it is to be presumed that, the same investigator doing the work, the proportional resemblances between tribe and tribe will remain practically uniform. The phonetic signs used agree with those in English, or rather show that the sounds for which they stand approximate the English sound so designated, with the following exceptions: the vowels in general have their continental values; *ạ* is the obscure a; *c*, English sh; *ê*, e in bell; *î*, i in mill; *ñ*, English ng; *tc*, English ch or tch; *dj*, English j in judge; *x*, velar spirant; *x̣*, the palatal spirant; ^{n} indicates that the preceding vowel is nasalized; *m̥* is a final m in some Karankawa words, "pronounced short and with the lips tightly closed," according to Gatschet; *E* stands for "eastern Atakapa dialect"; *W* for "western Atakapa dialect." In Coahuilteco García uses an apostrophe (') to show that the preceding consonant is pronounced with stress, i e., like a fortis; elsewhere it merely marks a pause. This is the only phonetic feature of any importance which seems peculiar to one language, but it is probable that, if our material had been collected when the languages in question were in a better state of preservation, it would be found to have been more widely distributed. It may be noted that the subjoined tables show some indication of an interchange between *k* and *p*. I have enclosed in parentheses portions of the Indian words which appear to be affixes.

LEXICAL RESEMBLANCES BETWEEN THE TONKAWA, COAHUILTECO, KARANKAWA, COMECRUDO, COTONAME, AND ATAKAPA LANGUAGES

ENGLISH	TONKAWA	COAHUILTECO	KARANKAWA	COMECRUDO	COTONAME	ATAKAPA
after		*wama(lēt)*		*semi*		
again	*etse(n)*	*tsa(x)*				
alone, only	*pax, paxa atak*			*paluem*		*iputs* (only), *pa-i* (too)
also		*hin, in*	*tén(no)*			
angry		*t'egul*				*yol*
anus, backsides		*til'*		*el*		*tol*
arm	*hitian*			*lot*	*katowan*	
arrow	*caxai*			*nkuak* (also reed)	*kaú* (also reed)	*skenne* (E), *tik* (W)
bow	*nixa-u*		*gaí*	*xaí, xaí patáple*		
aunt	*ahan, wacek, tahenênеyu*	*makīt'ān, tsal, mitcal, xotāl, tatce, taic, makis*		*ken*		
bad	*êx*	*k'aux, sax(pam), cāic*	*tcúta, kassítcuwakn* (to injure)			*hatse-ec* (W), *ikau* (E)
good, well	*hinox*	*manām, cap'ān*	*pla; klaban* (well, healthy)	*(pe)lé, (pe)séx*	*kênás*	
be, to	*eno* (to live)	*tci, tcoxai, so*		*aneluem*		*-c, to, a, uc*
believe, to	*tetceno*			*yene* (to think)		*nai*
belly	*acwi*			*wax*	*kox, kuwele* (within)	*kom, kimati* (inside)

ENGLISH	TONKAWA	COAHUILTECO	KARANKAWA	COMECRUDO	COTONAME	ATAKAPA
bird	*kola*	*awayam*	*kudn*	*xam*	*komióm*	
black			*pal, ma, mel*	*pa-yataú*	*ba-i*	*mel, yañ*
body				*newasól*		*al*
break, to	*yatcmaxet, yax-matce, kelaxa*	*k'xuākalap'*	*táhama*	*aptak*		*kĕts, tsal*
breast	*yatcǫx*	*tsots*				*itsk*
breast, female	*năyoman*	*tam*	*kanín*	*kném*	*kĕnám, knám*	
brother	*hena*	*kuānilāp, matsān*		*kanosa*		*nitset*
burn, to	*ma-i, melne*			*(pa)makua*		
capture, catch, or take, to	*he-ul, ta-an, nuku* (to take)	*tco* (to take)	*haitn*	*hel, gatile*		*icul, yal, ko*^{n}
cold	*hatsex*			*(pa)sowe-tiaú*	*hăwéss, ăwéss*	
come, to;	*yetoka* (to arrive), *eta; haháwa* (they gather together), *we-ewan,* toward	*kal*	*ka's, kas, éwe, éwe-e* (come here!)	*antgió* (come here!), *yak,* to come		*mok, han, ti,* to come near; *ta,* to come out; *o,* to come; *in,* to come in
go, to	*xa, yaku(na), kux, wana* (they go)	*kal, kuan, (oux)-pakō* (to go away), *kai* (to walk)	*yĕ; wána* (let us go! or go away!)	*(pa)kió*	*awóyo* (go over there!)	*non, wan*
conceal, to	*tcapa*			*kama(t)*		
companion	*ta-* (to go in company)	*paxti*				
crane	*k'a-u*		*kĕdō'd*	*kol*	*karakór*	

English	Tonkawa	Coahuilteco	Karankawa	Comecrudo	Cotoname	Atakapa
cry or weep, to	*maka*	*wāyo*	*owi'ya*		*xakue* (to weep) *pama* (to cry)	*hai, yo-u*
dance, to	*yakawe*					*(cok)ak*
deer	*ao*			*ewē, e-uė*		
flesh		*hēuh, hāuh, hēux, hāux*		*ewē kaí, ewé ewē*		
desire, to;		*tāpamō*	*ta*	*mek*	*tilcáx men* (what do you want?)	
die, to	*lumatx(o), wawa*	*xum, (kuan)tsam*	*mal* (dead)	*(pa)plaú* (dead)	*wátêxo* (he died)	
sleep, to	*choxno*	*tsamōxuām*	*tm*	*(n)emét*	*mátsêkuka*	
lie down, to	*tapitcne* (to lie on one side)	*(oux)t'āmo*	*wu-ak*	*(pa)kol*		*nok, yoxt, holli*
divide or separate, to		*saxop*		*papaptak* (to divide), *xop* (far)		*hopa-i*
do, make, become	*he-ikewa, yekewa*	*hawai, hōi*	*káhawan*			
dog	*ekwan*		*kiss*		*kowá-u* (dog) *kissá* (fox)	
drink, to	*(hen)uk(no), xane, xana*	*ouxo*	*akwetén*	*pamkam*	*xuáxe*	*am, ka-u*
duck	*cona*					*coknok*
ear				*alí*		*an*
eat, to	*yax*	*ham*	*aknámus*	*(pa)kaí, (pa)kaku* (to masticate)	*haháme, xaxáme, akwanamie* (to masticate)	*kul, ya*

ENGLISH	TONKAWA	COAHUILTECO	KARANKAWA	COMECRUDO	COTONAME	ATAKAPA
end, to	*ehe(wa)*	*xāi*		*ehaplame*		
enter, to	*akuna, axuna*	*yāx*				
evening		*tcum, takōm*		*(pa)lesóm*		
fall, to	*ela (?)*		*amoak*	*mel, (pa)mesaí*		*mak*
far, far off	*tcawal*		*wal(nia)*			
father	*ewac*	*mama*		*mam, mawís, mos*		
fight, to		*kōẃwako*		*(alig)wak(le)*		
fire	*naxtcan (nax,* to burn)	*talōm*	*húmhe, kwátci*	*len*	*mánêx*	
fly, to				*unakêkiú*		*kau*
foot				*emí*	*ayésim, ayésema*	
forehead				*pex*		*mak*
forget, to	*nxeno*	*xām*		*halêkám*		
friend	*ta* (with, in compounds)	*tāwan* (to be a friend)				
give, to	*ax*			*ayemá*		
goose	*xilik*		*la-ak*		*krak*	
grandfather		*puk'al*				*kulca*
grandmother	*ekak, ekac*	*kīs, kāka*				
great	*kwalo*	*(ap)nān*	*ya-an, wol* (a great deal of)	*poskám, pakmát*	*katám, katara*	*hêts, kome, uc*
hand		*māux*	*étsma* (and finger)	*mapí* (and finger), *xam mapí,* "bird-arm" i. e. wing	*miapa* (wing)	

ENGLISH	TONKAWA	COAHUILTECO	KARANKAWA	COMECRUDO	COTONAME	ATAKAPA
handle, touch, to	*ta-an*		*tcaútawal*			
have, to	*ka*					*ka, ke*
he, she, it	*el*		*tal*			
that, this, the	*tel, taka, watac, el, wi*	*ta, pi*	*tal*			
hear, to		*tcakwĕi*		*ye, kenkiwaye*		
heart	*yatsanan*	*xasāl*		*kayasél*		
horn				*yêmó, yemó*	*yómo*	
dwell, to		*txam*		*apayuemle*		
house		*txam*	*ba-ak*	*wamák*		
husband		*k'ău*		*tkuaú*		
I, me, my	*ca, caya, ka* (obj.)	*tsin, na-, ta-* (obj.)	*náyi, ná-i*	*yen* (me, my), *na* (I)		
if	*eyuk*	*awaxta, ĕ, ĕx*				
iron, gun, rifle				(*pa*)*mióp* (gun)	*komiop* (iron), *komiópo* (gun)	
jump, to	*tsuxûma, yakawe*		*eṃ*	(*pa*)*káu*		*wak*
kill, to			*ahúk*		*wátxuka*	
knife			*silekáyi*	*xayepó*	*ĉhiá-u*	
know, to	*atxesa*	*xō*	*kwass, kúmna*			*uxts*
laugh, to	*xaxaya*	*mayá*	*kaíta*			*hayu*
leaf	*xace-i*			*xaísel* (*xaí*, tree)		*wac*
lightning	*meltcetcanen*			(*pa*)*melói*, (*pa*)*mák* (thunder), (*pa*)*mok* (thunder)		

ENGLISH	TONKAWA	COAHUILTECO	KARANKAWA	COMECRUDO	COTONAME	ATAKAPA
love, to	*kec, ha-a*	*kawa*	*ka*	*kuail*		
maize	*tu'lêxan*		*kwiáṃ*	*taweló*	*tawaló*	*necóum* (E)
man, male	*haakon*	*xagū*		*gnax, gnā*	*xuainάxe*	*cakiol* (male), *icak* (man)
people, Indian		*pilam*	*yámawe* (man)		*xaíma* (Indian)	
many, much	*anohok, ha-ac, hi-wêl*	*oxāux, (ap)aux*		*yawet*		*he-u*
marry, to	*ta-e*	*tāyagū* (said of a man; also sig. "wife")				
mesquite				*tan*	*dan, tánie* (?)	
milk			*tenakwáya*			*nik*
miscarry, to	*tcana*	*tcal*				
moccasin, shoe			*té-u*			*na-u*
moon	*naacoat, (nas,* to shine)	*ānua* (month)		*kan*		
mother	*issa, xai*	*lēic, tai*				*teñ*
mother-in-law	*tcām*					*hican*
near			*lekál, pahuaíl*			*ipal, ol*
night		*takōm*				*tēgg* (E)
nine	*sekwac (kwalo)*					*woc*
no, not	*akai, kena, kapa-i*	*ox, oxua* (no) *axam, yaxam* (not)	*kóm, kwó-om, kwōm*	*kam*		*-ha*
nose				*yax*	*yá'ex, ya'x, yax*	

English	Tonkawa	Coahuilteco	Karankawa	Comecrudo	Cotoname	Atakapa
now	*huc*	*nakuē*	*acáhak*			*nak*
old, ancient	*kuca*					*waci*
one	*wece*		*nā'tsa*			
place or put, to	*pap*	*xakauko*		*ahuap*		
pregnant	*aciawa*	*sahui(n)*				
push, to	*yakelan*		*dan*			*tsañ(c)*
quick, quickly	*matan* (?)	*xuāko ayē*	*ewé-e, ewē, tólos* (to run quickly), *xankéye, xanki* (to hurry)			*maṇ*
rabbit				*kiexuén*	*kiáxhem*	
rat, mouse	*tcux* (mouse)			*kuemét* (rat)	*tsêmáx*	
rattlesnake	*senan hatak* (real snake), *senan-tsasan-kan* (snake having rattle)			*wemúk* (*pa*)*sél* (*pasél* probably means "to rattle")		
red				*pamsól*	*msá-ê*	
river, water	*tcakau* (river) *ax* (water)			*ax*	*atmaha-ú, atmaú* (river), *ax,* water	*akon(st), ta-i* (river) *ak, ka, kau* (water)
round	*pilil, kopol*			(*pa*)*wapél*		
run, to	*yakuna, yantsets*; *xana,* to go away; *xayen,* going		*tólos; xankéye* (to run or hasten)		*mtára*	*paknau, tsat, akna* (water)

ENGLISH	TONKAWA	COAHUILTECO	KARANKAWA	COMECRUDO	COTONAME	ATAKAPA
say, speak, tell, talk	*hepa, hetatsa*	*kā, masō, um, awam*	*kaúpn, pátsim, gaxiamétēt* (I spoke)			*wants, ko-i*
scratch, to	*yutca, xwacaka*			*(pa)kawai* (to scrape)	*átsiu*	*kam*
sea (?)			*gllé-i*	*glaí, klaí* (tortoise—perhaps connected or a misunderstanding)		
see, to	*yalce*	*mas*	*tca*	*imáx, máhe*		
sexual organs	*nel* (both sexes)	*malāux* (male)		*melkuai* (female)		
shoot, to	*yak, yela*			*apakalle, (pa)-yehepi*		*pēm, pots*
sick	*atcan*	*tsa, t'al*	*kwátco*			*ctin*
sing, to	*hikto*			*pekná*		*yok*
sister	*ula*					*hilet*
sister-in-law	*macek ala* (also applied to other relations through marriage)	*mitcāl*				
sit, to	*yila*		*hékēs, háka!*	*(pa)nelpaú*	*páwe*	*ke*
six		*tcikuās*				*tsik*

ENGLISH	TONKAWA	COAHUILTECO	KARANKAWA	COMECRUDO	COTONAME	ATAKAPA
sky	*tcele-i* (above, etc.)	*uxuăl* (heaven, of theology)		*apel*		
small, little, young	*yatca, caxun*	*can*	*kwăn, kwa-an*	*kicáx*	*kuwósam*	*cka, ts'on*
boy			*glo-essĕn*	*(pe)lawís*		
girl	*ahan, wixun*					*kal, kun*
south				*kiaú*		*akipa-i*
stand, to	*helepa*			*nelpók*	*páwia*	
steal, to		*tcălak*				*tsăn*
stone, rock				*woyekuél*		*wai*
strong	*tsekau*	*tso* (?)		*(pa)seweliau*		
sun	*taxac*		*dó-owal*	*al*	*ŏ, o*	
day	*taxac*	*t'il*	*bákta*	*(pa)matamak*	*ŏ, o*	*yil*
yesterday			*tuwámka*	*lesumák*		*tĕm, tĕll*
tall	*hawei*			*(pa)ptewet*		
tear, to			*táhama*			*t'lem*
there	*hiyek*		*nya*			*ya*
think, to	*yetsa(n)*	*nako*		*yene*		*nai*
thing	*hitcuwax*			*tokom*		*cok*
thou, you, thy	*eya, hawelak, na, yel, ya-, he* (obj.)	*xa-, ma-, xamaken* (pl.)	*awá, áwa*	*nána, ye-ina* (you pl.)		*na, n*
three			*kaxayi*	*yiy*		
together		*xokoimō*				*kuk-*
tired	*koxo*		*kwăl*	*pohokuét*		

ENGLISH	TONKAWA	COAHUILTECO	KARANKAWA	COMECRUDO	COTONAME	ATAKAPA
tooth			*é*	*i, iy, he-ewu-i*		
tree, wood	*ninxacan, xace-i* (leaf)		*akwini*	*xai*		*kak, nec*
turkey	*himaxan*			*esmakuét*		
two	*keta-i*	*axlĕ*		*alekueten* (or *asequeten*)		
very	*anohok*			*eikahuak*		*nak*
where?	*ala, ale* (?)	*anu, ani*	*mudá*			*ma*
whip, to	*ya-uxtca*	*wats*				*pats*
whistle, to	*yăkwucana*			*(pa)pusamai*		*yok, woc*
white	*maslak*		*péka*	*(pa)pók, (pa)púk*	*mesó-i*	
wind	*poxo* (to blow)		*ba*	*(pa)pót* (and to blow)		*pats-pats* (E)
witch		*yĕwal*		*tewalisel*		
with	*ta-*	*t'an*		*hel*		*ŏl*
yes	*hehe*	*ää, xa*	*hié-l*	*ya-unó*		*haha*

Following is a supplementary list of resemblances between Tonkawa and Comecrudo:

ENGLISH	TONKAWA	COMECRUDO
another	*kalak*	*ap'hel*
beat, to;	*na-uyena*	*aneluak(le)*
black	*kaxau*	*yatau*
buy, to;	*hayuwa*	*huam*
chew, to;	*k'a-itc*	*kai*
cohabit, to	*ta-e*	*tailam*
cover, to	*nawaḷ, tc'el*	*walai*
crow	*kal*	*pal*
cut, to	*kaetca; hama*	*kawī; wemak*
flexible	*kiyukyax*	*payayel*
follow, to	*yax*	*yap*
heavy	*k'estau*	*maketiau*
high	*takak*	*pakna*
hollow, hole	*saxaḷ*	*pehiol, pohuel*
inside	*yakwa*	*ayapa*
just now, now	*hōsh*	*pus*
lip	*k'alá* (mouth)	*xal*
low	*k'ês*	*pus*
lower	*ayei* (under)	*eulak*
mock, to	*maka, pap*	*emet pakale*
open, to	*tcal, yā'kuḷaxê*	*ekokle, walai*
pipe	*kue-nuxun* (pipe-stem)	*kahuel*
seed	*xēl*	*hekel* (?)
shall	*tana*	*aneluem*
skin	*nawaḷ* (or covering)	*emol* (also hair on body)
smell, to	*toxno*	*exno, pohuen*
thorn	*tek*	*tel*
tie, to	*yawewe*	*yenawile* (tied)'
wound, to	*yela* (to shoot and hit)	*(pe)waile*

To bring out the facts contained in these tables it will now be necessary to find how many opportunities for comparison there are between every two languages and what proportion the resemblances bear to that number. This is shown in the following table. It should be remembered, however, that the comparison between Tonkawa and Atakapa is not complete.

	Cases	Resemblances	Proportion
Coahuilteco–Karankawa	55	25	.454
Karankawa–Cotoname	43	18	.418
Comecrudo–Cotoname	74	26	.351
Coahuilteco–Comecrudo	105	36	.342
Tonkawa–Cotoname	71	24	.338
Coahuilteco–Cotoname	25	8	.320
Karankawa–Comecrudo	94	27	.287
Tonkawa–Karankawa	114	32	.280
Tonkawa–Coahuilteco	165	46	.278
Karankawa–Atakapa	129	22	.170
Coahuilteco–Atakapa	153	26	.169
Tonkawa–Comecrudo	425	65	.152
Comecrudo–Atakapa	202	29	.143
Tonkawa–Atakapa	294	38	.129
Cotoname–Atakapa	85	7	.082

In many instances the change of a single number would produce a very considerable alteration in the relative position of the above pairs in this table, therefore too much reliance must not be placed on it. In general we find about what was to have been expected: that peoples near each other show more mutual resemblances than those at a distance; but some of the results are quite unexpected. Thus Karankawa, which has been assigned to a distinct stock, would appear to have been closest to Coahuilteco, while Comecrudo and Cotoname, supposedly dialectically related to Coahuilteco, are farther away, and on the other hand little nearer to each other than they are to Karankawa. If Orozco y Berra believed, as his map appears to indicate, that Cotoname belonged to the Coahuiltecan and Comecrudo to the Tamaulipecan stock, he was very far out of the way, since Comecrudo is even nearer to Coahuilteco than is Cotoname. Nevertheless, all of these languages, including Karankawa, are as a whole nearer to one another than to Tonkawa or Atakapa, and as between the two latter languages nearer to Tonkawa. It is remarkable that Tonkawa appears to be much closer to Cotoname than to Comecrudo.

Considerable additional light has been thrown on the linguistic conditions in the area we are discussing by the researches of Profesor Bolton. These seem to make it clear that, whether the stocks

hitherto assigned to this region are connected or not, they do represent so many divergent groups in the sections where they have been established. The position of the Tamaulipas tribes is, however, still very uncertain.

Among the things unearthed by Professor Bolton was a short vocabulary which he states was near the end of the original book of baptisms of San Francisco Solano mission, and dated 1703–08. This mission was founded in 1700 south of the Rio Grande, below Eagle Pass. In 1718 it was removed to San Antonio, but as that was after the period when these words were recorded, they are evidently from the speech of some tribe or tribes near its original seat, in a region usually assigned to the Coahuiltecan family, and Coahuiltecan it evidently is. Nevertheless an examination shows that this dialect diverges very considerably from the other known dialects. Below I give in tabular form the results of a comparison of the words in this list with corresponding expressions in the languages we have been considering:

English	San Francisco Solano	Correspondences[1]
three	*genin* (or *genint* ?)	
four	*saath*	*sɬkɬt* (T), *tsets* (E A)
fur	*no*	*ela* (hair) (Com), *nǫ-u* (W A)
tortilla	*kainika*	
I am hungry	*nabaog*	*ámel* (hungry) (K)
tobacco	*sihik*	*ax* (Com), *tsit* (W A), *tsigg* (E A)
salt	*tciene*	*sepén* (Com), *dá-ăn* (Cot)
meat	*nikaog*	*heux, ahaux* (Coa)
give me!	*sieh*	*ayema* (Com); *yen* (me) (Com); *ax* (give), *tsin* (I) (Coa); *hemic* (T), *(ke)-weke* (gave me) (T)
water	*apam*	*ax* (Com, Cot, T), *atmahau, atmau* (river) (Com), *awana* (Coa), *ak* (W A)
there are	*taapam*	*tapa* (Coa)
there is none	*paam*	*paaxam* (Coa), *kam* (Com), *pa-i* (intensive) (T), *kom, kwó-om, kwōm* (K)
mother	*naha*	*tai, tsawax* (Coa), *xai* (T), *kaninma* (K)

[1] *E A*, Eastern Atakapa; *W A*, Western Atakapa; *Coa*, Coahuilteco; *Com*, Comecrudo; *Cot*, Cotoname; *K*, Karankawa; *T*, Tonkawa.

father	*papam*	*ma'ma* (Coa), *mam* (Com), *behema* (K)
brother	*(s)oyâ*	*oolaak* (sisters and brothers) (T)
sister	*(s)opaâm*	*pen* (W A)
is she your sister?	*hykomeyâ*	
eat it!	*namô*	*ham* (Coa), *hahame, xaxame* (Coa), *ya* (T), *aknámas* (K) (to eat)
bad	*krisen* (or *krigen* ?)	*k'aux* (Coa)
yes	*aapag*	*hehe* (T), *āā* (Coa), *ya-unó* (Com), *hié-ē* (K), *haha* (A)
he wishes (desires)	*hypayô*	*tâpamó* (Coa)

We find that out of the twenty-one words and expressions preserved from this dialect 11 have resemblances in Coahuilteco, 8 in Tonkawa, 8 in Comecrudo, 6 in Karankawa, 6 in Atakapa, and 3 in Cotoname. As in the previous cases, Tonkawa and Atakapa are at a great advantage, and Coahuilteco, Cotoname, Comecrudo, and Karankawa at a great disadvantage in this comparison, therefore the great number of resemblances between this dialect and Coahuilteco is more significant than the figures indicate, and the small number of correspondences with Atakapa of similar significance. With equally good material from all of these dialects it is probable that the order would be: Coahuilteco, Comecrudo, Karankawa, Cotoname, Tonkawa, Atakapa. There is at least little doubt of the dialectic relationship of this language to that incorporated in García's *Manual*.

A few isolated words from other mission archives yield a little information beyond this. From a group of tribes near the Rio Grande, embracing the Parchaque, Mescaleros (not the Apache tribe so called), Yoricas, Chomes, Alachomes, and Pamais, the word *asaguan* [*asawan*], meaning 'heart,' is recorded, and *ganapetuan*, 'a large body of water,' their name for the Rio Grande. The first falls readily in line with Coahuilteco *xasāl*, Comecrudo *kayaśél*, and Tonkawa *yatsánan*. The first part of the second is evidently a variant of Coahuilteco *aguana* (probably pronounced *awana*), 'water,' while *-petuan* has points of resemblance with Coahuilteco *apnān*, Karankawa *yá-an*, Comecrudo *pakmát*, and Cotoname *katám*, all meaning 'large.' Again *yana guana* is given as the name

of San Antonio river in the language of the Payaya tribe. The second word is, of course, Coahuilteco for 'river' or 'water'; the significance of *yana* I have not determined.

From the Aranama, a tribe which lived near the present Goliad and persisted into comparatively late time, one expression survives, recorded by Gatschet from a Comecrudo Indian who had heard it used. This is *himiána tsáyi*, 'give me water.' *Himiána* is said to mean 'water,' and it suggests the Coahuilteco *awana*. The *tsa* in *tsáyi* is very likely the objective pronominal prefix of the first person singular, and if so evidently related to Tonkawa *ca*, Coahuilteco *tsin*, and San Francisco Solano *sa*. The whole word *tsáyi* may be nothing more than the Aranama equivalent of the Tonkawa independent pronoun of the first person, *cáya*, or it may consist of the pronoun *tsa* and a stem meaning 'to give,' related to the Comecrudo *ayemá*, and perhaps Coahuilteco *ax* and Atakapa *e*.

Although evidently related to Coahuilteco, the dialect of San Francisco Solano shows that there was considerable divergence on the part of some Coahuiltecan languages, and this fact makes it easier to conceive that several of the so-called stocks might really have represented dialects more divergent still. It is my own opinion that the number of resemblances between Karankawa on the one hand and Coahuilteco, Comecrudo, and Cotoname on the other—especially in view of the small amount of Karankawa material available for study—indicates that this group at least formed an offshoot of the Coahuiltecan stock. While we do not know that the same held true for all the tribes of Tamaulipas, the case of Comecrudo points strongly in that direction, and it is also indicated, though less strongly, by an analysis of Maratino.

All the linguistic material available from Maratino is contained in a war-song, or supposed war-song, in that language, one short sentence, and a few words, all copied into Prieto's History of Tamaulipas from an unpublished work of Father Santa María, a Franciscan missionary. This is corrupt and difficult to analyze, but a considerable number of stems may be isolated and some hints gathered regarding the grammatical structure. Following is a practically complete list of the words contained in this material

with their nearest correspondences in the languages of the group under discussion.

ENGLISH	MARATINO	CORRESPONDENCES
plural sign	*-a*	(see next—in same position after noun)
many (prefixed)	*a-a*	*he-u* (A); *ha-ac* (T); *axāux* (Coa)
drink, to	*baah* (*ka*) (let us drink)	*pix, am* (A); *pamkam* (Com); *xuaxe* (Cot); *ouxo* (Coa)
wolf	*bum*	*kombox* (Cot)
and	*he*	*xwe, et, ekla* (T); *mi* (Coa)
not	*-he, -hi* (a little uncertain)	*-ha* (A); *akai* (T); *axam, yaxam* (Coa); *ka* (Com); *sa* (?) (Cot); *kom* (K)
(diminutive suffix)	*-i*	
?	*ka* (the only word in which *k* is used in the original)	
shots	*catamá* [*katama*]	*pēm* (A); *odu* (K); *komiop* (gun) (Cot); *apakat(le)* (Com)
us (?)	*co*, or *comi* [*ko, komi*]	
enemies, to the	*coapagtzi* [*koapagtsí*]	*kome, magasu* (A); *wol* (K); *tso* (Coa)
forces, strength	*cohcoh* [*kohkoh*]	(?); *tsekau* (T)
deer	*cons(gio)* [*kons(gio)*]	*lans* (A); *kĕma's, kĕmasia* (?) (Cot)
altho—but yet	*cuaahne* [*kuaakne*]	*tukuaxam* (Coa) (at that, in that)
able (?)	*cugtimá* (?) [*kugtimá*]	*uxts* (A); *tam* (Coa)
run, to	*cuino* [*kuino*]	*yakuna* (T); *pakna, akna* (to run, as water) (A)
far	*cuiücicuimá* [*kuiüsi-kuimá*] (there very far away)	*meskám* (Com)
lions [panthers]	*juri* [*xuri*]	*xuepet* (Com)
shout, to	*maamehe* (to shout for joy)	*pama* (Cot); *maka, meka* (T)
jump, to	*maatzimetzu* (giving leaps)	*tsuxuma* (T); *em* (K); *pux, wak* (A)
bird	*magch* [*magtc*]	*cokcoc* (A); *komiom* (Cot); *xam* (Com); *awayam* (Coa)
bow	*mahká*	*nixau* (T); *kémma* (Cot); *dĕmoa* (arrow) (K)
them	*me-, mi-*	*mi-* (Coa); *nawis* (Com); *we* (a Tonk. demonstrative)
meat	*migticui* [*migtikui*] (who eat meat)	*tilc* (T); *kĕmas* (Cot); *nikaog* (San Francisco Solano)

English	Maratino	Correspondences
weep, to	*mimigihi* (will not be weeping)	*maka* (T); *wayo* (Coa); *owiya* (K); (*pa*)*ulamaí* (Com)
our, we	*ming, mi*	*mi* (an example in Com) (Atak has *wi* in 1st pers. sing.)
now (?)	*mohká*	*nak*(A); *inaknē* (Coa); *aca'hak* (K); *wan* (T)
like, after the manner of	*nigua, nighua* [*niwa?*]	*nak* (A); *tetca* (T)
to go or to shout (the context leaves the exact meaning in doubt)	*nohgima*	*non* (to walk) (A); *awáyo* (let us go!) (Cot); *ki*(*o*) to go (Com)
kill, to;	*paahchu, paahchu, paagchichu* [*paahtcu, paagtcitcu*]	(*pa*)*kamau* (Com); *nima* (A); *lumatxo* (T); *mal* (dead) (K); (*pa*)*plau* (dead) (Com); *pix* (A)
flee, they will make them	*tzi pamini* [*tsi pamini*]	*pako* (to go away) (Coa)
cord	*pomg*	*ō* (A); *yapłua* (to twist) (T)
arrow	*xiri* [*ciri*]	*caxai* (T); *skenne* (E A)
woman	*chiguat* [*tciwat*]	*kwan* (T); *tāgu* (Coa)
the (pl.)	*tze* [*tse*]	*tci* (these) (T); *tce-* (many) (Coa); *ya* (A)
children, the	*tzicuini* [*tsikuini*] (*tzi* = these?)	*kwān* (little and child) (K); *tsiĉ* (A)
mountain	*ka tamugni* (to war on the mountain), *matomau* (to the mountain)	*natun* (T)
see, to	(*ming*) *metepeh* ((we) see them)	*imax, mahe* (Com); *mas* (Coa)
sleep, to	*megtuché* [*megtutcé*] let us sleep	*tcoxno* (T); *oi* (A); (*n*)*emet* (Com)
come home, we	*coomutepá* [*koomutepá*]	*eta* (T); *ti* (to come near), *mok, o* (to come), *ewe'* (come here!) (A)

At the best this is not very satisfactory. Still the method of indicating plurality and negation, the words for wolf, to run, to shout, them, arrow, the (or these), and traces of similar forms to indicate the first person plural, present resemblances strongly suggesting that further material would give us more certain grounds for classifying Maratino with the Coahuiltecan stock. It is sur-

prising to find so many similarities with words from Atakapa, but this may be due rather to the abundance of Atakapa material than to an actually close relationship.

The Tonkawan stock was evidently strongly marked off from both Coahuiltecan and Karankawan, and yet the resemblances which we find point to an ancient linguistic unity between it and those we have just considered. Atakapa is apparently more remote, and it has more features in common with Chitimacha, the next language to the east, while there are traces of contact with Tunica and even with the Muskhogean tongues.

Perhaps the most striking point brought out by this investigation is the surprisingly close resemblance between Cotoname, which was spoken near the mouth of the Rio Grande, and Tonkawa. Referring to our table it will be seen that of all the languages compared with Tonkawa, exclusive of Atakapa, Cotoname seems to present the most relative resemblances and Comecrudo the least, although Comecrudo and Cotoname were exceedingly close to each other. On the other hand Atakapa seems to come closer to Coahuilteco in spite of the fact that the Atakapa tribes were anciently in actual contact with the Tonkawan tribes, which lay between the territories of the two. There would appear to have been two principal divisions of the Coahuiltecan stock: one including Coahuilteco, Comecrudo, and probably Karankawa, with which Atakapa was nearest related, or which had influenced Atakapa the most, and one represented by Cotoname and Tonkawa.

For it becomes increasingly evident that at least Karankawa and Tonkawa were anciently of one stock with the Coahuiltecan dialects, that is, if the three or four Coahuiltecan dialects known to us belonged to one stock. If Karankawa is nearer Coahuilteco than Comecrudo and Cotoname, and as near Cotoname as is Comecrudo, it is absurd to classify Coahuilteco, Comecrudo, and Cotoname arbitrarily in one stock and exclude Karankawa from it. The case for Tonkawa is not so good, but the surprising resemblances which it presents with the remote and little-known Cotoname, along with other similarities that crop out, leave little doubt that it belongs in the same connection, although until a structural examination has

been carried out it might be best to leave our classification *in statu quo*. While it would be premature to go any farther at present, I believe the time will come when we shall find it necessary to do so. Indeed we may discover relationships among Southern tribes to extend far beyond the limits we have hitherto believed possible. Consider, for instance, the suggestiveness in the following series of terms for 'water': Cotoname *ax*, Comecrudo *ax*, Tonkawa *ax*, Atakapa *ak* or *kakau*, Chitimacha *ku* or *kun*, Natchez *kun*, Choctaw *oka*, Alabama *oke*, Hitchiti *oke*, Creek *oiwa*. There are of course few cases as striking as this; but why the resemblance over such an extended area? That there should be some features in common between the Muskhogean dialects and those languages spoken west of the Mississippi was to have been expected if Muskhogean migration legends are to be relied on, and careful investigation will perhaps show it to have been closer than we have hitherto believed. If that should prove to be the case it will be another powerful argument against the strict correlation of race and culture. The tribes on the lower Mississippi and east of it were comparatively as cultured as were those west of it (the Caddoan tribes excepted) uncultured.

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LINKS BETWEEN RELIGION AND MORALITY IN EARLY CULTURE

By ELSIE CLEWS PARSONS

IT is becoming a commonplace of ethnology that the connection between religion and morality is a late cultural fact. And yet this particular reaction against the ecclesiastical view of society is true only on the narrowest definitions of religion and of morals. It is not true if by morals we mean collective or social conduct as against conduct antisocial or individualistic, and by religion we mean supernaturalism.[1] To these meanings we shall undoubtedly hold unless our reaction against theology has not been thorough, leaving us still at heart theologues or their unwitting bastards, metaphysicians.

What then are the relations between religion and morality in early culture? They begin for the savage, as for us, in the nursery. In savagery, as in civilization, the supernatural sanction has a nursery rôle. Santa Claus, who writes down the names of the good children only in his book, the "bogey man" who carries off naughty children, the old witch who catches runaways, the god who promises longevity to filial offspring, all have their counterparts in the discipline of the savage child. In Australia, hard-pressed Illawarra mothers have been overheard to say, "Mirirul [the tribal high god] will not allow it."[2] Irritated West Victorian parents threaten to send for a moon spirit that does the bidding of Muurup, an epicure of child-flesh.[3] Samoans have a juvenile scarecrow in *Sina 'ai Mata*, or Sina the Eye-eater, a bird-god. "Do not make such a noise; Sina the Eye-eater will come and pick out your eyes," an harassed parent would say.[4] Thompson River and Kootenay

[1] In our sense. The supernatural to us is in other cultures unquestionably natural. Cf. Lévy-Bruhl, L., *Les Fonctions Mentales dans les Sociétés Inférieures*, passim.

[2] Ridley, Wm., *The Aborigines of Australia* (Sidney, 1864), p. 137.

[3] Featherman, A., *Social History of the Races of Mankind* (London, 1881–91), Sec. Div., p. 172.

[4] Turner, G., *Samoa* (London, 1884), p. 74.

Indian parents also threaten noisy children with a bird. "The Owl will come and take you," or "I'll give you to the Owl," they say.[1] Eastman, the Sioux, remembers how, in his less sophisticated days, his grandmother would say to him at night, "Do not cry! Hmakaga (the Owl) is watching you from the tree-top."[2]

A "good" child does not cry. Nor, for the peace of his elders, must he be adventurous. It is troublesome to look for children who run away. And so would-be explorers are threatened with supernatural mishap. A Ḳoita child who strayed in the bush at night would encounter a *vadavada*, a man who travels by night and who brings sickness and death to those he meets.[3] The Euahlayi tribe of New South Wales have a bogey called from his cry Gineet Gineet. He goes about with a net across his shoulders into which he pops any children he can see.[4] Chemosit is a Nandi devil, half man, half bird, with one leg, nine buttocks, and a red mouth which shines at night like a lamp. He catches children who are foolish enough to be lured away from home by his night song.[5] 'Nenaunir of the Masai is a kindred monster; he is an invulnerable, stony-bodied creature with the head of a beast of prey and feet with claws; "Don't go too far," a mother says to her children, "or 'Nenaunir will get you!"[6] An obedient child among the Masai or elsewhere ordinarily stays at home or within call, but sometimes if he hangs around he may be in the way. When their elders begin to eat it is etiquette for Caffre children to leave the hut. The older comply, but the younger hang around for "just one taste." Then their father bids them go out into the veld to call Nomgogwana, a dangerous and peremptory monster. If the children demur, the father will say off-hand, "Very well, sit where you are; the food will not cook, as you know, till Nomgogwana comes, and then when he does come he will be so angry at seeing the food uncooked that he will

[1] Teit, J., "The Thompson River Indians," *Mem. Amer. Mus. Nat. Hist.* (New York, 1900), II, 108.

[2] *Indian Boyhood* (New York, 1902), p. 9.

[3] Seligmann, C. G., *The Melanesians of British New Guinea* (Cambridge, 1910), p. 187.

[4] Parker, K. L., *The Euahlayi Tribe* (London, 1905), p. 137.

[5] Hollis, A. C., *The Nandi* (Oxford, 1909), p. 41.

[6] Merker, M., *Die Masai* (Berlin, 1904), p. 202.

eat all the children he can find." As the frightened children slip off, the father calls out to them: "Be sure you go far, far away into the veld, for otherwise Nomgogwana will not hear you; the reason why he did not hear you call before was that you did not go nearly far enough away; so be sure to go far away this time, lest you get eaten yourselves."[1]

Moral stories for the young are not lacking among savages. Once on a time in Pulu, an islet of the Torres straits, the boys and girls used to disobey their parents and play a game of twirling around with outspread arms. They played every night on the beach, until finally a great rock fell from the sky and killed all the islanders except one indispensable couple. Parents still tell their children never to play this game at night, and the old men remind bad children that by and by, if they are not good, the stone from Pulu will come and eat them up.[2] In another of the folktales of the Torres straits, a mother and grandmother threaten a fractious girl with the Dògai if she will not stop crying. She fails to heed them, and the bogey does carry her off to torture.[3] The Bunya-Bunya of Queensland have a story about two boys who were once left alone in camp with strict orders not to leave it until the elders returned. Nevertheless, tiring of the camp, the boys went down to the beach. Then the Thugine, or Great Serpent of the Rainbow, came out of the sea, and, always on the watch for unprotected children, caught the boys and turned them into the two rocks that now stand between Double Island point and Inskip point. "Here you see," the old Blackfellow used to say to the boys, "the result of not paying attention to what you are told by your elders."[4] On Rogea off southeastern New Guinea once lived a little girl, say the islanders, a little girl over-fond of wandering about. "At all times her mother and father they said, 'Don't wander, or else the sorceress in the bush will eat you.' The girl didn't listen, she walked

[1] Kidd, D., *Savage Childhood* (London, 1906), pp. 96–7.

[2] *Reports of the Cambridge Anthropological Expedition to Torres Straits* (Cambridge, 1904), v, 22.

[3] Ibid., v, 14.

[4] Howitt, A. W., *The Natives of South-East Australia* (London and New York, 1904), p. 431.

about. The old woman saw the girl and called her and said, 'You come.'" She took the girl to a cave and tattooed her.[1] "She boiled the blood and ate it." Had not the girl run home, she would have eaten her too.[2] In a story told by the Bètsilèo of Madagascar a naughty little boy is eaten up—by a *songòmby*, a creature big as an ox, but fleet-footed. The parents had put the boy outside of the house, calling out, "Here's your share, Mr Songòmby." The beast came and the child cried out, "Oh, here he really is!" "Well, let him eat you," cried the parents, thinking the boy was fooling. And he did.[3] The Bilqula of the Northwest coast tell the story of a chief's daughter who one night would not stop crying. Finally her mother said to her, "Lie down and be still or the Snēnē'ik will come and get you." At midnight, when all were asleep, the Snēnē'ik did come in the shape of an old woman, and, catching the child through a hole in the wall, put her in a basket and carried her off.[4]

Terrifying ceremonial masks as well as "Sunday-school" stories are helps to primitive parents. In western Victoria the white kangaroo pouch masks worn over head and face by clowns at corrobborees are often used to frighten misbehaving children.[5] In one of the Zuñi summer dances there is a mask of an old woman, a ceremonial scold, and part of her "business" is to threaten to eat up the children.[6] A kachina in a Hopi dance makes the same threat. The Hopi mask goes up to the child and says: "You are naughty and bad; we have come to get you. You fight the other children, kill chickens, etc., and we shall now take you away."[7] Among the Pueblo Indians of the Rio Grande I have collected several

[1] The legend was told the investigator to account for tattooing.

[2] Seligmann, op. cit., p. 493, n. 2.

[3] Sibree, J., *Madagascar before the Conquest* (London, 1896), pp. 230–1.

[4] Boas, Franz, *Indianische Sagen von der Nord-Pacifischen Küste Amerikas* (Berlin, 1895), pp. 248–9. At Masset, Graham island, a Haida half-breed girl told me this summer mothers threaten naughty children with an old woman. She comes from under the earth to carry them off.

[5] Dawson, J., *Australian Aborigines* (Melbourne, etc., 1881), p. 83.

[6] Fewkes, J. W., "A Few Summer Ceremonials at Zuñi Pueblo," *Jour. Amer. Ethnol. and Archæol.*, I (1891), p. 42.

[7] Voth, H. R., "The Oraibi Powamu," p. 118, *Pub. Field Columbian Mus.*, Anthrop. Ser., III, Chicago, 1901–3.

stories of refractory children frightened by masked figures, "like Santa Claus," one woman said to me. It is said that a "progressive" Santa Clara man once on a visit to San Juan tore the mask off a figure who was alarming the children and that because of the outrage he was kept imprisoned in the estufa for some time in danger of his life, and that he finally had to be ransomed with a horse and saddle.

Infantile bugaboos are replaced in many societies by spirits especially attentive to young people, "goody-goody" stories supposed to appeal to them succeed to the simpler nursery yarns, and renewed is the emphasis on the supernatural rewards or penalties for the filial or unfilial. Among the Tshis the family god is expected to appoint a *sassŭr*, a subordinate spirit, to walk behind the growing girls of the family.[1] Once on a time, goes a Kayan story, a woman and her daughter were reaping paddy. The girl left alone by her mother was told on no account to eat any of the rice, as it was against the tribal custom to eat while reaping. But the girl disobeyed. Thereupon hair began to grow all over her body and she had to take to the jungle like a coconut monkey.[2] Among the Fors, girls meddling with the milk-pots or stealing milk behind their mothers' backs are punished with epilepsy by a *zittan*, a spirit servant of the great mountain god of Gebel Marah.[3] At Ponape, in the Caroline islands, the ancestral spirits put an unending curse upon the unfilial.[4] Ainu women teach their daughters that were they to marry without being properly tattooed, after death the demons will do all the tattooing with very large knives and at one sitting.[5] Aztec youths were said to be warned by their fathers against unfilial conduct in order not to be devoured by wild beasts or come to an otherwise bad end.[6] The Ainu and the Aztecs

[1] Ellis, A. B., *The Tshi-Speaking Peoples of the Gold Coast of West Africa* (London, 1887), p. 94.

[2] Hose, C. and McDougall, W., "The Relations between Men and Animals in Sarawak," *Journal of the Anthropological Institute*, XXXI (1901), p. 191.

[3] Felkin, R. W., "Notes on the For Tribes of Central Africa," *Proc. Roy. Soc. Edinburgh*, XIII (1884–6), p. 223.

[4] Christian, F. W., *The Caroline Islands* (New York, 1899), p. 72.

[5] Batchelor, J., *The Ainu and Their Folk-lore* (London, 1901), pp. 23–4.

[6] Clavigero, *The History of Mexico*, ed. 1807, I, p. 332.

do not represent, of course, as early a culture as some of the other groups from which we have been drawing illustrations, groups where dependence on parents or subjection to them ends with or even before adolescence. In these more primitive groups it is the tribal elders who go on with the education of a girl or a boy.

It is at the tribal initiation, of course, that the elders step in. During it the young get considerable moral teaching of both a direct and an indirect nature from the elders, and taboos are laid upon the initiates which serve to strengthen the social hold upon them of the state, i. e., the elders. Besides, these taboos may increase materially the privileges and prerogatives of the old people—the more so as the taboos may extend over considerable periods both before and after initiation. Breaking the taboos is apt to be supernaturally punished, particularly breaking taboos relating to food, to sex conduct, and to preserving secrecy. In Australia the boys and girls of the Lower Murray tribes thought that if before initiation they ate emu, wild duck, swans, geese, or black duck, or the eggs of any of these birds, their hair would become prematurely gray and their muscles would shrink.[1] Wotjobaluk boys are forbidden to eat of the kangaroo or the padi-melon on penalty of falling sick, breaking out all over with eruptions, and perhaps dying. If young Wakelbura men or women eat forbidden game, they will probably pine away and die, uttering sounds peculiar to the creature they have eaten. Its spirit enters into them and kills them. Howitt heard of a Kurnai boy who had stolen and eaten opossum before he was permitted, in accordance with the food taboos, to eat of it. The old men made him believe he would never grow up to be a man. He did lie down, in fact, under the belief, and within three weeks he died.[2] Death by meteorite or lightning punishes boys and girls who break the food taboos in other Australian tribes.[3] As for

[1] Beveridge, P., in *Jour. and Proc. Roy. Soc. N. South Wales*, XVII (1883), p. 27.

[2] Howitt, pp. 769–70.

[3] Palmer, E., "Notes on Some Australian Tribes," *J. A. I.*, XIII (1883–4), p. 294; Helms in *Proc. Linnean Soc. New South Wales*, Sec. S., X (1895), p. 393.

Supernatural penalties for breaking food taboos are common, of course, outside of Australia; nor are they confined either in Australia or elsewhere to adolescence.

The effects of food taboos, if not the alleged purposes, are more or less social or

sex taboos[1] and their supernatural sanctions, among the Lower Murray tribes the sight of a woman for three months after the novice's teeth have been knocked out would bring numberless misfortunes upon him—withering up of limbs, blindness, general decrepitude.[2] Were a Kurnai youth to touch a woman at a certain stage in the initiation he would, he is told, fall seriously ill. Were a woman's shadow to fall upon him he would surely become thin or lazy or stupid.[3] At Bartle Bay, New Guinea, boys believe that if they do not keep from intercourse during and before initiation their hair will not grow.[4]

Initiates are told not only to keep away from women, they are explicitly warned to keep their secrets hidden from women lest supernatural evils befall. The Urabunna initiate is made to believe that should any woman see one of the secret sticks, he and his mother and sisters would drop dead.[5] In New Guinea, Kiwai Island initiates are warned to maintain secrecy at the risk, among other consequences, of being seized with a fearful incurable disease.[6] In the Elema district an impersonation of Kovave tells the initiates that if they divulge the secrets to the uninitiated,[7] he will punish

moral. They may protect the food supply of a favored class, the old against the young, men against women, chiefs against commoners. Pregnancy or lactation food taboos may convey a sense of parental "responsibility." The totemic taboos are anti-cannibalistic, it not being sociable to eat your kinsman. The mourning taboos show "consideration" for the dead.

[1] Australian elders are greedy about women as well as about food; but the sex restrictions they put upon initiates are not so much for purposes of immediate monopoly as they are to insure a good start, so to speak, on that separation of the sexes in public so characteristic of primitive society.

[2] Beveridge, p. 27.

[3] Howitt, "The Jeraeil, or Initiation Ceremonies of the Kurnai Tribe," *J. A. I.*, XIV (1884–5), pp. 306, 316, and *Native Tribes*, p. 402.

[4] Seligmann, p. 496.

[5] Spencer, B., and Gillen, F. J., *The Northern Tribes of Central Australia* (London and New York, 1904), p. 498.

[6] Chalmers, J., "Note on the Natives of Kiwai Island, Fly River, British New Guinea." *J. A. I.*, XXXIII (1903).

[7] Aside from initiation, secrecy in esoteric affairs is often safe-guarded in primitive circles by a supernatural sanction. Among the Ewes the lightning-struck or poisoned are thought to be killed by Jehve for tattling about him (Spieth, J., "Der Jehve-Dienst der Evhe-Neger," in *Mitt. der Geog. Gesell. zu Jena*, XIII (1894), p. 19). When Fewkes insisted upon witnessing the Hopi ceremony of snake washing, he was cautioned to leave the kiva; if he stayed, he would "swell up and burst." Bursting or

them with disease and death. If they let it be known that the whining of Tiparu, the bull-roarer, is not the cry of a god but the work of a man, the curse of Tiparu, equivalent to death, is upon them.[1]

Elema women flee their villages to escape the curse of hearing the voice of Tiparu.[2] In many other communities women are kept from prying by supernatural sanctions. Elsewhere[3] I have pointed out how thoroughly in other particulars they are kept in their place by supernatural sanctions or by their mere fear of the supernatural, how they are discouraged from trespassing or straying from home, from eloping or committing adultery or marrying again, how they are rendered docile and obedient. To their husbands are given magical means of detecting their infidelity; for the undetected, a difficult labor or death in childbirth is in store;[4] men disguised as ghosts or gods break their spirit for adventure or revolt. Sometimes the gods themselves condescend to discipline the wayward or the inquisitive.

Supernatural sanctions attach to violations of sex habits other than monogamy.[5] For illustrations of what dire things happen to men who break through the taboos upon a woman during menstruation let me refer again to another discussion.[6] But at Mowat, New Guinea, I have since noted a variation from the usual type of menstruation taboo. If a Mowat man have connection with a

other direful troubles came to one beholding rites none but a priest might see ("The Snake Ceremonials at Walpi," *J. Amer. Ethn. and Arch.*, IV (1894), p. 83).

[1] Holmes in *J. A. I.*, XXXII (1902), pp. 421, 425.

[2] Chalmers, J., "Toaripi," *J. A. I.*, XXVII (1898–9), p. 329.

[3] *The Old-Fashioned Woman* (New York, 1913), ch. xx, "Policing Her Supernaturally." See also Frazer, J. G., *Psyche's Task* (London, 1909), ch. iv.

[4] There are other supernatural punishments too—misfortune for the whole kampong among the Bataks (Steinmetz, S. R., *Ethnologische Studien zur ersten Entwicklung der Strafe* (Leiden and Leipzig, 1894, II, p. 357); "accidental death" in the Sawu islands, at the will of their deified lawgiver (ibid., p. 358); a plague of rain (for unchastity among the unmarried) among the Sea Dyaks (Perham, J., in *Jour. Straits Branch Roy. Asiatic Soc.*, No. 8, pp. 149 sq., Singapore, 1882).

[5] Frazer has given illustrations (*Psyche's Task*, ch. iv) of the suffering falling supernaturally upon the group as well as upon the offender, and he suggests that this vicarious suffering leads to further collective pressure upon the individual to conform to custom—truly a very striking linking together of supernaturalism and morals.

[6] *The Old-Fashioned Woman*, ch. xi, "In Quarantine."

woman after he has had it with a menstrous woman, it is supposed that he will die.[1] Incest, a peculiarly abhorrent offense to primitive man however he defines it, is very apt to be punished, he believes, either automatically or by an outraged spirit. In the Kêi islands the incestuous are supposed to fall ill;[2] among the Khasis they are struck by lightning or killed by a tiger or they die in childbirth; in the Omeo tribe of Victoria they are beaten by "jidjigongs" or snakes, and the punishment is the more fearful because it may hang over them for years.[3] The Kenai ascribe their increase in mortality to breaking their exogamous rules.[4] Matthews once asked a Navaho what would happen if he married a woman of his gens. "I would have bad fortune," he said; "I would fall into the fire and get burned, the lightning would strike me, the cold would freeze me, or the gun would shoot me—something fearful would happen to me."[5] On the Herbert river, Queensland, anyone marrying into prohibited sub-classes will sooner or later die in consequence, his behavior being offensive to Kohin, an earth-roaming spirit of the Milky Way.[6] Among the Caffres, offspring of an incestuous union will be a monster, a punishment inflicted by an ancestral spirit.[7] Aleuts too believe that incest is always followed by the birth of a monster with walrus tusks or beard.[8]

Whether or not the practice of avoidance is a safeguard against incest,[9] it is apt to have, like indubitable exogamous rules, a supernatural sanction attaching to it. It is believed in Victoria that if a man see his mother-in-law, or is seen by her, evil spirits will afflict him or disaster of some other kind will befall him.[10] That a woman's hair will turn white if she speaks to her son-in-law or even looks

[1] Beardmore, E., in *Jour. Anthr. Inst.*, XIX (1889–90).

[2] Bartels, M., *Die Medicin der Naturvölker* (Leipzig, 1893), p. 29.

[3] Helms, p. 392.

[4] Steinmetz, II, p. 352.

[5] "The Study of Ethics Among the Lower Races," *J. Amer. Folk-Lore*, XII (1899), p. 6.

[6] Howitt, *Native Tribes*, p. 498.

[7] Shooter, J., *The Kafirs of Natal and the Zulu Country* (London, 1857), p. 45.

[8] Petroff, I., "Report on the Population, Industries and Resources of Alaska," *Tenth Census of the United States* (Washington, 1884), VIII, p. 155.

[9] For another interpretation of it see *American Jour. of Sociology*, Jan. 1914.

[10] Smyth, R. Brough, *The Aborigines of Victoria* (Melbourne and London, 1878), I, p. 95.

at him is the belief of other Australian tribes.[1] If a Uganda woman hands anything to her father-in-law she will be afflicted, she thinks, with tremor.[2]

In Nias intercourse during pregnancy is punished by sickness.[3] In fact in very many places intercourse during pregnancy or during lactation is held to bring disaster to a woman or her offspring. In East Central Africa "it is believed" that a girl who does not mate at nubility will die.[4]

"It is believed," writes Macdonald of this African point of view. Who believes it? Presumably the girl herself, and assuredly because she got the idea from her elders. To make the young settle down in marriage is a favorite undertaking of the elders, and an important factor in the subjection in which they keep not only the adolescents of the tribe, but all their juniors. This ascendency they establish at initiation, but most of the life of their juniors they regulate or at least meddle with. And this control is based for the greater part on their control of the tribal system of supernaturalism. Moreover, they may be heeded by their juniors, thanks merely to their very reputation as supernaturalists. In no end of places old women are feared because of the power of witchcraft imputed to them; besides, the curses of the aged,[5] like the curses of the dying, are held to be especially potent and dreadful.[6] The aged and the moribund alike are imminent ghosts, and ghosts are believed to be unusually well qualified to carry out threats. They are good at

[1] Howitt, *Native Tribes*, pp. 256–7.

[2] Roscoe, J., "Further Notes on the Manners and Customs of the Baganda," *J. A. I.*, XXXII (1902), p. 39.

[3] Bartels, p. 29.

[4] Macdonald, J., "East Central African Customs," *J. A. I.*, XXII (1892–3), p. 101.

[5] Westermarck, E., *The Origin and Development of the Moral Ideas* (London and New York, 1906), I. pp. 619 sq.

[6] Very entertaining is a recent illustration of this kind of gerontocratic control. "Not long ago," writes an observer of Turkish customs, "the wife of a former Grand Vizier, Haihiddin Pasha, died. On her death-bed she expressed as her last wish that her twelve-year-old daughter might take special courses in medicine, similar to those given to men. There was nothing for the government to do but to hastily open certain of these courses to women in order that they might not be cursed by ignoring the dying wish of a respected old woman." (Buell, Katherine, "Behind the Veil," *Harper's Weekly*, Aug. 15, 1914.)

bestowing favors too, so that kindness to those with one foot in the grave is at least a prudent policy.

But respect for age is sometimes specifically imparted by the elders by means of the supernatural sanction. Once during a general quarrel Spencer and Gillen saw one of the younger men, i. e., a man between thirty-five and forty, and a medicine-man at that, try to strike one of the older men. At once at this grave offense his precious medicine powers left him.[1] An Aleut who is disagreeable and disrespectful to the elders has no luck in hunting; on the other hand attentiveness to the old insures longevity and good fortune in the chase or in war.[2] The ancient Hindus are well outside the circle of peoples we have been accounting in quite a general way primitive, but one of their expressions of respect for seniority is inculcated so primitively that I cannot forbear mentioning it. "The vital airs of a young man mount upwards to leave his body when an elder approaches," declares Manu, "but by rising to meet him and saluting he recovers them."[3]

A deferential treatment of the elders may be prompted, we noted, by the fear of what as malevolent ghosts they might do to the living.[4] Once they are ghosts the need of keeping them in a good humor is even more imperative. Hence the living and in particular the surviving kindred are bound to pay proper respect to the dead. Inattentiveness to a ghost is apt to be sorely punished by him. A slighted ghost in the islands of Torres straits would cause strong winds to destroy the gardens of his neglectful relatives and break down their houses.[5] The Thompson River Indians believe that death

[1] Spencer and Gillen, p. 22.

[2] Petroff, pp. 153, 155.

[3] The Laws of Manu, II, 120, *Sacred Books of the East*, XXV.

[4] Other injuries in life besides neglect in old age may be punished by resentful ghosts. In the Elema district of New Guinea dead warriors visit their old enemies at night and keep them from sleeping by tickling their feet. The murdered invariably plague their murderers (Holmes, pp. 428, 429). Hudson Bay Eskimo have deserted the island of Akpatok since the murder on it of some shipwrecked sailors (Turner, L. M., "Ethnology of the Ungava District," *11th Rep. Bur. Amer. Ethn.*, 1894, p. 186). Greenlanders hold that an aborted child or an illegitimate deceased is transformed into an evil avenging spirit (Rink, H. J., *Tales and Traditions of the Eskimo*, (Edinburgh and London, 1875, pp. 45, 439 sq.).

[5] *Reports Cambridge Anthr. Exped. to Torres Straits*, VI, 127.

or sickness would come upon one taking possession of the bow and arrows, leggings and moccasins of a departed kinsman.[1] Among the Koita of New Guinea relatives who infringed upon the dead man's funeral rights or who neglected them were punished by his *sua*[2]—in what way we are not told. Ghost haunting, a severe enough punishment in itself, is very commonly a consequence of funeral improprieties. Such considerations about the dead are quite pertinent, let me say, to a study of morality in early culture, for in it, we should not forget, the dead are an integral part of society. We have to realize, too, that in their treatment by the living morality and supernaturalism are indistinguishable.

Funerary destruction of property is partly prompted by the desire to preclude ghost walking, to keep the ghost from coming after his own, after what has been and still is a part of himself. It is one of the earliest and most marked ways of recognizing the right to property. But there are other primitive ways in which a supernatural sanction is invoked against the misappropriation of property, ways I particularly wish to indicate. Ignoring the fact that our own morality being a property morality compared with the morality of early cultures, primitive gods seem to us far more indifferent to theft than Jahveh or the god of the framers of our criminal codes. But like men, like gods—or ghosts. And theft, so far as it goes, is punished by primitive spirits. A ghost of the islands of Torres straits may be aggrieved not only by remissness as to his funeral rites, but by dishonesty toward his heirs, and he may be revengeful on their account also.[3] It was the special business of one of the gods of the Tracy islands to watch and kill thieves.[4] In East Central Africa magic stakes are driven into the ground on the edge of the corn fields. Thereafter anyone touching the crops will die on the spot.[5] The Wanika protect their plantations and fruit trees in like way.[6] Throughout the islands of the

[1] Teit, p. 331.

[2] Seligmann, p. 191.

[3] *Reports of the Cambridge Anthr. Exped. to Torres Straits*, VI, p. 127.

[4] Roth, W. E., *North Queensland Ethnography* (Brisbane, 1903), Bull. V, p. 29.

[5] Macdonald, p. 120.

[6] New, C., *Life, Wanderings*, etc., *in Eastern Africa* (London, 1874), p. 106.

Malay archipelago sickness followed from eating food stolen from tabooed fields.[1] On the Bloomfield, in North Queensland, the older men to whom the country originally belonged will give out that certain tracts of it are "yirru" (*yirru* is an underground spirit), so that if any but themselves eat or camp there or disturb the soil in any way whatever, Yirru will punish them with grievous sores.[2] Indeed boundary fetishes of one kind or another are not at all uncommon among primitive peoples. The automatic supernatural sanction also attaches again and again to the preservation of property.

In the Bowditch islands a man dead is asked to confess through the voice of a priest what he had done to cause his death. Among other offenses he might confess to theft.[3] The god's proxy or priest is often called upon in cases of theft. Batak thieves were cursed through the magic staff of the great priest of Balige.[4] Pilfered, an Ossete goes with the *kurismezok*, "the wise man" or sorcerer, and his cat to the house of anyone under suspicion. "If thou hast stolen the article," exclaims the *kurismezok*, "and dost not restore it to its owner, may this cat torment the souls of thy ancestors!"[5] A Tshi bereft of his property will make an offering to his local god and ask his priest to beg the god to proceed against the thief.[6] Quakery, the Ju-Ju king of New Calabar, who ranked above the king in all purely native palavers, religious or civil, told de Cardi that if the king tried to detect robbers it would have little effect, because the king was a man like themselves from whom they would steal if they got the chance. "But if I sent round a notice that if the thieves did not immediately bring me the stolen articles, my Ju-Ju would cause them (the thieves) to swell up and burst, you would see how quickly they would come to me and deliver up the stolen goods."[7]

[1] Bartels, pp. 28–29.

[2] Roth, p. 29.

[3] Turner, G., p. 272.

[4] Brenner, J. von, *Besuch bei den Kannibalen Sumatras* (Würzburg, 1894), p. 226. Turner, G., p. 283.

[5] Haxthausen, *Transcaucasia* (London, 1854), pp. 398–9. Needless to say the imprecation is often effectual.

[6] Ellis, p. 75.

[7] de Cardi, C. N., in *Jour. Anthr. Inst.*, XXIX (1899), pp. 51–2.

To recover stolen or lost property, especially ponies, is one of the principal tasks of the Apache medicine-man. He does it through crystal gazing.[1] Through some unspecified magical means the Koita sorcerer also recovers stolen things.[2] In fact the medicine-man is for theft as for other offenses the first professional detective.

The medicine-man, or priest, is apt, too, to preside over ordeals, on the theory perhaps that his god will be on the side of the innocent.[3] At any rate the emphatic presence of the priest at the ordeal makes for an association in thought between the moral and the supernatural. So does his presence at initiation ceremonies. Quite often he is in charge of them, and it is he instead of the elders who teaches the youth the tribal morals. His tendency to take a hand in all the daily affairs of life, a tendency quite as marked in primitive as in modern times, has a like effect. Being a representative of deity his slightest interference with any social relation gives it a supernatural coloring.

A priest's authority is naturally supported by his god. From their priestly derivation, if for no other reason, early forms of chieftaincy might be expected to have a supernatural backing. But a mystical, representative quality too seems to attach to chiefs or leaders. They express or embody the welfare of the community and of each of its members. Subservience to them means communal and individual prosperity; contradiction or disobedience means disaster. The Massim of Bartle Bay work in the garden of their chief, believing "if they did this their own gardens would be good."[4] In Nias a certain severe throat ailment is supposed to be due to quarreling with a village headman.[5] The Tonga gods were under-

[1] Bourke, J. G., "Medicine Men of the Apache," *9th Ann. Rep. Bur. Ethn.* (1887–8), p. 461.

[2] Seligmann, p. 133.

[3] That the ordeal (or the oath) may be merely magical (see Westermarck, II, pp. 118 sq., 687 sq.) does not concern us, for we are not weighing the character, moral or non-moral, of the gods. It is enough for us that to the ordeal (and to the oath) a supernatural sanction attaches. But into a fuller disscusion along this line I will not go, as its viewpoint would be somewhat different from that to which I am limiting our discussion.

[4] Seligmann, p. 458.

[5] Bartels, p. 28.

stood to punish disrespect to chiefs almost as severely as disrespect to themselves.[1] In the Mortlock islands the spirits of dead chiefs punished offenses against their colleagues in the world with sickness, curable only by the gods through the mediation of the living chiefs.[2]

It is not only political rebels who have been punished by ghosts. Among the Dakota and in the Malay archipelago they are believed to torment iconoclasts of all kinds.[3] For any infringement of tribal customs the Koita *sua* might smite offenders with sickness or call down upon them bad luck in hunting or fishing.[4] Elsewhere the gods, too, posing as backers of custom as custom, are against iconoclasts. If the Narrinyeri are asked why they keep to any custom, they answer that Narundere, their "All Father," commanded it.[5] Daramulun, the high god of the coast Murring was believed to have laid down the food rules and to punish those who broke them.[6] The Tchiglit Innuit believe that they are injuring deity and calling down divine punishment upon themselves because they are adopting foreign customs.[7] Ainu iconoclasts know they are sure to suffer from the wrath of the gods.[8] With these instances from primitive society of what is perhaps in modern life the most conspicuous part of its rôle, its support of custom as custom, I may fitly conclude my sketch of the supernatural sanction on morals.

At the outset of this paper we contented ourselves with identifying moral with social conduct and then passed on at once to give illustrations of the supernatural sanctions attaching to such conduct. It is plain, I trust, that from this far from novel point of view morality has been little if anything but the prevailing system of keeping people in their place, out of other people's way, juniors out of the way of seniors, one sex out of the way of the other, kindred

[1] Mariner, W., *An Account of the Natives of the Tonga Islands* (London, 1817), II, pp. 155, 237.

[2] Kubary, J., in *Mitth. d. Geogr. Gesell. in Hamburg*, 1878–9, p. 256.

[3] Eastman, M., *Dacotah* (New York, 1849), pp. xx, 87. Schoolcraft, H. R., *Indian Tribes* (Phila., 1851–57), II, pp. 195–6. Bartels, p. 28.

[4] Seligmann, p. 192.

[5] Woods, J. D., *The Native Tribes of South Australia* (Adelaide, 1879), p. 55.

[6] Howitt, in *J. A. I.*, XIII (1883), p. 192.

[7] Petitot, E., *Les Grands Esquimaux* (Paris, 1887), p. 35.

[8] Batchelor, pp. 58, 177–8.

out of the way of kindred, the desitute or the subject out of the way of the man of property or the chief, lay or ecclesiastic, the dead out of the way of the living, the adventurer out of the way of everybody. For accomplishing this social distribution there seem to be three main methods: public opinion (including, of course, ridicule, its most potent weapon), the sanction of the group working naturalistically (ostracism, i. e., execution, exile, imprisonment, and mutilation or fine), and the sanction working supernaturally, i. e., automatically or magically, or through spirits. The availability of these several methods varies in different cultures. In particular the availability of the supernatural sanction varies, as one might expect, with the scope of supernaturalism characteristic of the given culture. Just as supernaturalism is far more a part of life in early culture than in modern, so concomitantly is the supernatural sanction. Our obliviousness to this fact has been due mostly to our unwillingness to recognize how insignificant religion has become to us, to what extent we get on without it,[1] how remote it is from our daily life.[2] Furthermore, denial of a relation between morality and religion in early culture may be due to our habit of studying the content of one moral code in terms of another, the Blackfellow's,

[1] How seldom, for example, do we hold that an untoward event is a punishment for our sins, a point of view common enough in primitive circles. When several deaths occur about the same time in the same For family, it is thought to be due to lying by one of its members (Felkin, pp. 230–2). In Samoa, if the offspring of a consanguineous marriage died prematurely, it was taken as a sign of the disapproval of the marriage by the household god (Turner, G., p. 92). Several centuries ago, the Chinese of the province of Camul, urged on by a reform governor, gave up their practice of sexual hospitality. Poor harvests and general misfortune ensued, because, said the people, they had foregone a custom cherished by the gods (*Marco Polo*, ed. by Yule, London, 1871, I, pp. 189–90). When the Merkedes, an Arab tribe, became Wahábys, they had to give up the same custom; a drought followed and, considering it a punishment, they got permission from the Wahâby chief to return to the good old practice of their forefathers (Burckhardt, J. L., *Notes on the Bedouins and Wahábys*, London, 1831, p. 102).

[2] Of its remoteness the mere existence of spirits is evidence according to Professor Lévy-Bruhl. The primitive mystic has no need of spirits; everything has for him an immediate mystical quality. The gods originate, so to speak, in secularization. From this point of view, the magical automatic sanction is earlier than the sanction imposed by deity. Such sanctions on morality as those of the historical religions may mean therefore that our morality is less religious than the morality of the savage.

for example, in terms of our own. An offense great enough in our eyes to keep its perpetrator out of heaven may be too petty in the eyes of the Blackfellow for such an automatic penalty to attach to it as attaches to the breaking of Australian food taboos or the rules of class exogamy, offenses quite without meaning to us.[1] The very claim that only the historical religions are related to morality is part and parcel of the antique conception that only our own morality or the morality of kindred cultures is morality at all. It is the final attempt of self-righteousness to pull the wool, so to speak, over the eyes of ethnology.

STONOVER FARM
LENOX, MASSACHUSETTS

[1] To the savage the supernatural or mystical attaches to much that to us is natural and merely objective. Defilement through death or through sex, for example, is still assumed in certain ways by us, but it does not begin to loom upon us as upon the savage. Impressed by such mysticism in savage life, one of its close observers writes me that to him there appears to be little or no relation between religion and morality in primitive life, supernaturalism attaching primarily to matters of a non-moral character. Even so, does it not attach as well to the social organization?

THE GUSLE SINGER AND HIS SONGS

By BEATRICE L. STEVENSON

THE occasion of the outbreak of European war serves to endow with importance and interest all matters connected with Servian customs and nationalism, and significant in the light of folklore psychology as well as in the realm of current events is the gusle (gusla) art of the South Slavic peoples. The *gusle javorove* is a little instrument of white-maple wood, with rounded back and parchment front, and a single string of horsehair—seemingly nothing more than a mere musician's trinket but found in many a Servian home, and vividly able to recall centuries of poetic outpouring of artistic impulses as well as many a living picture of the guslar singers themselves, those bards who sang and still do sing the songs of the people in Servia, Bosnia, Kroatia, Slavonia, Dalmatia, Montenegro, and all the provinces of the Adriatic. Hitherto but little noticed by dwellers in the outside world, these singers yet date their rise from before the era of the Troubadours in France, who, like the skalds of old in Scandinavia, went from palace to hut made eagerly welcome by the beauty of their balladry. From ancient Greece itself the guslar may have sprung, for Serbo-Kroatia and the south-lying districts have really for all time seen the figure of the blind old man who, like the Scotch bard and the Greek rhapsodists, was the nourisher of a people's patriotism. In the music that the blind old man made are to be detected figments of a people's life, the hidden existence which is led by all of us, detached from duties and extraneous pleasures,—intense, solitary and yet dominant, the idyllic life as it may be called. This the guslar with his queer, wedge-shaped instrument, sitting perhaps at the foot of a tree, strumming contentedly idyllic measures, or tumultuously heroic measures, or wantonly capricious measures, or longingly sorrowful measures,—all this the poet wayfarer has expressed for the people of Serbo-Kroatia.

That he is a relic of the past cherished only by a few individuals

who recognize the importance of this messenger of an older time, is regrettable. The many pass on unattentive to the sensitive melody of his compositions, or to the significance which these compositions may bear to the folklorist, the ethnologist, and the musician. For many reasons gusle music is important, for many reasons the songs of the Slavs should not be neglected but preserved and raised to a position of importance among the cultures of the nations. The songs as sung were a people's possession, passed down from father to son, mother to daughter, but unfortunately they were wild flowers in the hands of heedless children, for seldom were they cherished.

Except for the efforts of Vouk Stephanovich-Karajich, who early in the nineteenth century collected and preserved for posterity the ballads of the Servian nation, except for the work of various collectors since then, and of the valuable present-day services of the Matica Hrvatska, a Kroatian literary association in Zagreb (Agram), much of this precious legacy of the Slavic peoples would have been lost. There have been few examples of guslar poets such as Kachich-Mioshich of the eighteenth century, who both sang as well as created and left records of his songs. Unless recorded with music and text as is instanced by the collection made by Francis Xavier Kuhach, the songs are likely to vanish; but collected and standardized, the texts have been translated into other tongues and so have reached the outside world. Thus did Servian verse make its way into the literary output of Goethe, Prosper Mérimée, and Jacob Grimm. Of all the work, however, of this character which is being produced today, there is no contribution more significant to Americans than the "Heroic Ballads of Servia," translated into English verse by Noyes and Bacon. In this recently-published volume the authors have succeeded in giving to the English-speaking world an illuminating insight into the picturesque content of Servian song.

But of more intense interest than the superficial setting of the guslar's jewel is the living content of the jewel itself, that is, the spell of gusle music and the imagery of its verse. Unfortunately the music cannot be conjured up here, but the imagery of the verse is glimpsed again and again in the stories, fanciful pictures of the fire and flash of Ravanitsa's golden walls, the milk-white beauty of veelah

maids, and the sumptuous show of bearskin horse-trappings. Stories of piety, of forcible love-making, or the rescue of loved ones, were woven by the guslar as he sat at the church gates on holy days, or sang to lovers gathered beneath the trees in the long, shadowy twilights. From out of the middle ages perhaps came such a song of God and the angels three sent down from heaven to earth, as sung once on a time by a blind old woman in the streets of Zemun (Semlin). A Fra Angelico setting seems to encompass this story of God who sent his angels, disguised as beggars and bearing gusles of maple wood, to find out how devout his people were. Many a pious home was found before the beggars entered the castle of the rich Gavana to be haughtily repulsed by Helena, the proud mistress who offered only a crumpled crust of bread, the like of which was "set of Friday, baked on Saturday, and taken from the oven on Sunday." For such an act God's curse would fall, in secret thought the angels three, till a sudden gift was offered them by Stephan, a lowly servant man, who proffered his pet, a lamb of his heart. A reward for goodness and a reward for evil followed the gift of the lamb, as the old song goes on to say, for God then blessed the servant man, but the mistress he caused to be dragged down by stones and drowned in the midst of the sea.

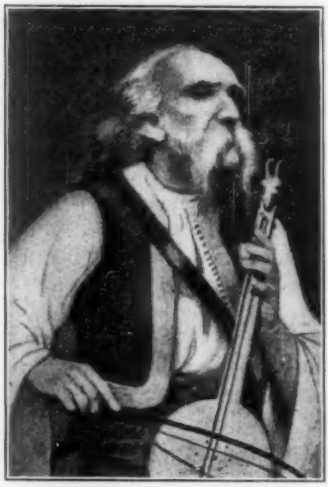


FIG. 8.—A guslar playing.

To be drowned in the depth of the sea, to be walled alive in the mortar of standing fortresses, to perish in dungeons, or to waste on the battlefield are deaths unsought which have nevertheless overtaken the heroines and heroes of many of these old ballads. In the walls of Scutari lies the record of an unforgotten, half-mythic legend of the girl wife of Goyko, the king who, for the safe building

of the city, sacrificed his young bride to the tower walls. The creeping horror of such castle walls and the damp dinginess of dungeon pits are not passed over when the guslar sings his songs, for a tale is told of Zanko, who for ten long years rotted in prison, till horror entered his soul, as disgust had claimed his body, and he wrote to his beloved, "Wait not for me, but marry another, that I may abandon myself to woe." But the story goes that the beloved, slyly employing deception, rode with her sister-in-law as Turkish viziers, tricked from the sultan the long-suffering prisoner, and carried him to safety once more.

Guile and sinister cunning, always the weapons of the Orient, have been employed again and again in the land that lies as a fringe on the Orient. A drinking song begins this way, as told in Zadar, the white: "I drink neither to you nor to me, but to the hero who would dare to go to Kotor and bring back the beautiful maid Aykuna." To which the doughty Smilyanich Iliya replied by springing upon his waiting mare and dashing off to the Turkish camp disguised as a Turkish vizier, there to deceive the assembled Turks, playing at hurling the deadly *topus* (javelin), by pretended stories of Iliya's weakness and a suggestion of facile conquest. Such genial frankness, fittingly met by the Turks with the courteous offer of coffee and tobacco, apparently persisted when Iliya politely begged instead for a kollo dance with Aykuna, the maid of his heart's secret desire. But a whispered confession between the dancing figures, a sudden covert sneer on the faces of the beholders, and the trickery of guile was discovered. With a leap and a forceful toss, the hero had fastened his conquest to the back of his kneeling mare, and flashed away as a fairy prince, aided by the veelahs, who ever desire to help the daring.

The conception of veelahs, a phantasy of all imaginative people, which is shown alike by children and peoples with a childlike mind, is also found in the poetry of the South Slavs. In the songs, in ballads, heroic legends, and almost in history itself the veelah persists. Like those faint noises which are heard at early evening, which seem as though they are and at the same time are not, so the imaginative Slav nature discerned evanescent traces of supernatural beings, maidens who, beautiful, young, and white-robed,

sympathetically concerned themselves with human affairs. Living in the streams, the high mountains and clouds, veelahs were joyous creatures who would dance at midnight or ride on the morning breeze. Rightly treated they were beneficent, but vexation produced irritation and mistrust, and their interference sometimes played havoc with human happiness, as is strikingly told in the tale of "The Serpent Bridegroom." King Budim, it was said, in complaining because of childlessness, was instructed by veelahs how to supply his lack. The fin of a fish taken in the depth of the Danube would prove the secret cure for his wife. But disaster followed this strange advice, for the son that was born was no human son but merely serpent spawn, and great was the chagrin in that royal house. Still shame could not outlive a parent's love, and, the serpent demanding a human bride, the father must do his bidding. That the veelahs' whim turned at the lovers' embrace proved only eventual ruse and deception, for the discarded skin of the serpent son, that was eagerly burnt by the queen mother, carried the charm of the prince's life, and gave a dead groom to the bride's embrace, as the veelah no doubt could long have foretold.

Likewise a summons to death could be pronounced by veelahs when heroes' lives were waning. So spoke a veelah to Marko Kralyevich on the height of Mount Urvina. A stumbling horse and a veelah's cry told Marko his end was near, for the veelah sang of two fir trees that grew on the top of the mount, where a spring ran bubblingly forth. In the spring was mirrored the day of death and the closing hour of conquering years to the glorious Marko, alone on Mount Urvina. Sometimes a hero's character was portrayed in veelah recitations. The story is told of a conversation between a veelah, an eagle, and this same Marko Kralyevich, whose kindness was remembered by the warrior bird which he succored in the battle of Kosovo. Blood-wet wings and a thirsting beak were carefully tended by Marko, who tenderly lifted the exhausted bird and bore it away to safety.

National figures like Kralyevich are extolled by the tongue of all peoples, and this is no less a characteristic of the South Slavs. Like Kralyevich for the Servians and Kroatians, Mustey Bey has been the particularly accepted figure for the Mohammedan Serbs in

Bosnia. Of these heroes many are the tales that are told and many the wonderful exploits recounted, phenomena which reveal the eternal youth of folklore story. Further, pictures of Tsar Lazar, big, bold, and black-bearded, riding over the hill, and of Turkish hosts, "like the clouds of heaven are their banners over all; and like the snows from heaven their tents upon the plain," are sights which vividly recall the heroes of old Servian war-days. The picturesque mood of those heroic days lies in the creative atmosphere of such phrases as—

> "A gray hawk from Jerusalem with a swallow in his beak,
> Flew onward into Servia, Tsar Lazarus to seek."

Conflict, turmoil, attack, and rebuff characterized the life of heroes. That the lives of women were less riotous is to be expected from the almost Oriental seclusion of their habits. Women were not supposed to go to the camp of their lords, as Hassan Aga's wife so bitterly cried out when she was repudiated by her lord for lack of love; women were supposed to stay at home, to tend the white castle and the young ones growing there. In the "Building of Skadar" it is told that even a prince's wife was accustomed to wash and dress her baby, prepare her husband's lunch, and set the house in order. Marko Kralyevich's mother, when she was growing old, addressed her son in terms of sorrow because she could no longer prepare his meals, light the lamp, or pour the yellow wine.

The women's songs give an insight into the lives of the feminine quarter, where the mistress and her household were accustomed to gather and listen to the visiting bard singing gusle songs to the lord and his attendants in an adjoining room. When a troubadour was especially trustworthy he would be permitted to go into the ladies' apartment. In that case he was allowed to sing only women songs, for nought do females care for heroic deeds, thought the master, who was accustomed to adjure his poet to sing of love and hope, of woman's devotion to man and the blessings of a double life.

The subjects of the women's songs cover a wide scope, from the peasant songs of faithful love or dirges for the dead, to the aristocratic handling of themes of honor and of passion. "The grievous ill of heartache" is most often the theme of feminine discontent. There is a song which recounts how a young wife repining at her

lack of children, wanders in a scented garden singing of her grief. Overheard by the mother-in-law, the idle complaint is repeated to the husband, who in great anger kills his wife only to find he has likewise killed his babe with her. Jealousy between mother and daughter-in-law or between sisters-in-law is frequently reprimanded by the moralist in song. Other songs show snatches of passion Oriental in splendor, as when kings promise their worldly all to obtain, as a beloved, the wife of another. "Castles in which no one has entered, horses which no one has ridden, sabres which no one has carried, all these will I give you," says a royal suitor to a reluctant inamorata, gowned with the splendor of the sun, moon-beam girdled, and jeweled with crowns and finger-rings. Vanity, thoughts of self, and adoration bounded a pretty woman's horizon. There is a story of Ali Aga's beloved who, though more beautiful than all other maids in Bosnia, and even Herzegovina, nevertheless was beautiful in vain because the love of her *banus* was turned instead to Omar's golden child, who lived like a bird in a cage knowing none of the lure of sunshine, nor the attraction of the white wheat springing on the hill. Peacock feathers in the hair and bright eyes that looked upon streets, where the merchants and the Turks would pass, are images that conjure up the Orient, as does also the motif of the Turkish fez in a little ballad, which sets a query thus: "To whom belongs the maiden who rides on the open sea, and winds her far-streaming hair under her Turkish fez?" The Byzantine influence marks certain ballads predominantly, as for instance, "The Maiden Margit and Rayko the Voyoda" and "The Marriage of Stoyan Yankovich," which originated in Servia while that country was under eastern rule.

Showing the influence of Constantinople and the East, reminiscent, furthermore, of old Greece and of the still earlier migrations of the Asiatic tribes, the Balkan songs, nevertheless, most strikingly revive a sense of the middle ages, for the art of the bard is distinctly feudal in nature. Very different from the life of the guslar today, was his existence in the days of knighthood. Employed by special Begs, the singers a century or more ago were accustomed to luxury and refinement; they rode about on the masters' horses, ate plentifully at a rich and sumptuous table, and lived withal a life of ease.

The employment sometimes lasted for life, in other instances, for a season; but in either case the singers were in the habit of changing their repertoires and inventing new variations to old songs. Even today this is done to a great extent, and it is on long winter evenings or during the days of fasting that the singer finds the best opportunity for such composition. Gathered in the coffee houses, in the *čaršija* or open market places, in the barracks or, during the summertime, in the out-of-door gardens, the poet singer finds his audience ready to listen and to reward him by rich presents of weapons, horses, cows, and heavy purses, or by flowers, fresh vegetables, and little coins, according to the affluence or niggardliness of his hearers. An audience may be made up of rich peasants, manual laborers, merchants, Christians, Begs, teachers, priests, or officials. Generally among the bystanders is a young boy who is learning to become a gusle singer. By word of mouth almost all songs are learned, and a lad generally begins at about his tenth or fifteenth year. Only one hearing is sometimes necessary to acquire a song, and a boy may often be taught at home, for the talent can descend from great-grandfather to grandfather, father to son. Up to the thirtieth year the singer readily picks up new songs, but after that he learns few. Most of the singers to be seen about the country are forty to fifty years of age; some give up singing when the cares of life overtake them, others are unble to sing after the occurrence of sorrow, as the death of a loved one.

The gusle instrument itself is like a little violin with one string. Sometimes two-sided gusles are seen, but both kinds are unfortunately being rather rapidly supplanted by the violin, and most recently by the accordion. Especially among the Hungarian gypsy players one hears the violin or the flute accompanying the chardash, the dance which, among the Hungarians, takes the place of the kollo of the South Slavs. The origin of these dances, of the gusle instrument and its music, is more a matter of conjecture than of knowledge. Historic traces sometimes lead to China and India, and the influence of Sanskrit culture may be detected. Deep in the life of the race runs the vein of gusle-music, which for the most part is simple and spontaneous, except where marked by the erotic features of outside factors. The time of kollo-dance music is $\frac{2}{4}$ as a rule, and $\frac{3}{8}$ or $\frac{3}{4}$

time generally signifies Tyrolese or Germanic influence. The accompaniment to the melody is generally very simple, composed of the tonic and the dominant. That the ballad or dance music is, in a cultural sense, merely fragmentary, awaiting formulative treat-

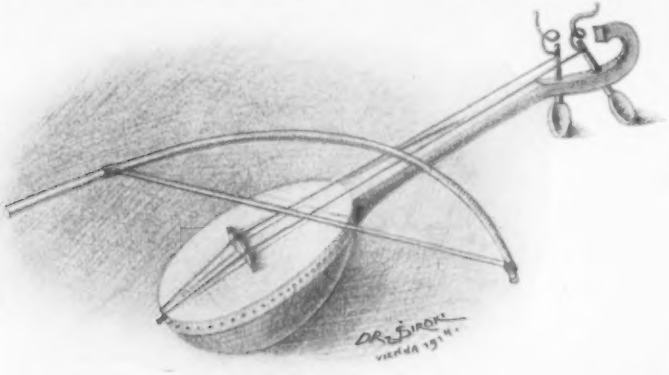


FIG. 9.—Gusle with two strings.

ment as rhapsodies, etc., by a master's hand is illuminatingly suggested by the discovery of Slavic themes in the music of Haydn and Beethoven.

FIG. 10.—Gusle with one string. (The bridge is missing.)

Further, because of their nearness to the life of the people, these kollo dances are instrumental in showing the kinship of all peoples which is manifested in their plays. The "Pillow Kollo," a dance with words and actions, is no other than the "Pillow and Keys"

game played by American children, while the song of the peacock is reproduced the world over by children who sing of the imaginary woes of a pig, a dog, or a wolf. The good-luck tidings expressed in the phrase "When my ships come in" is retold in the kollo song of the veelah who was robbed of her bracelet by a prince. "One ship shall bring powder, another the guns, and a third the warriors to revenge my loss," the angry veelah is said to have cried.

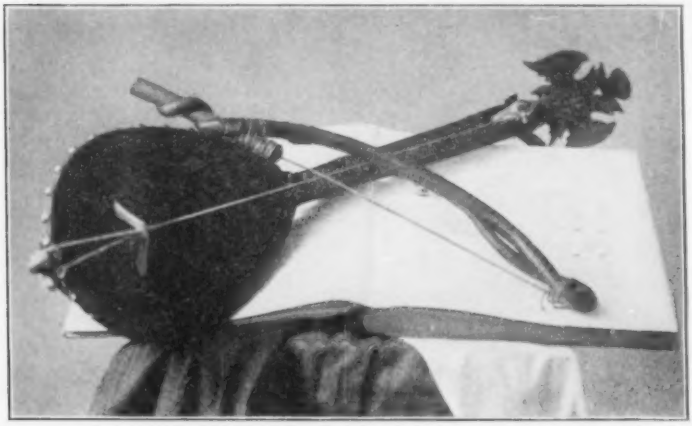


FIG. 11.—Gusle with one string.

But that the kollo was usually danced without words demands that to enjoy the dance to the fullest, one must hear the music and see the dancers themselves. The sight of embroidered jackets, blue stockings, and the flashing glint of ducats under a Turkish fez argues for enjoyment, for abandonment and joyous animation. White scarfs wave and dark eyes play to the answering sparkle in swains' eyes as maids and youths dance under the open sky. The scent of wine on the cooling air, the call of nature in the summer breeze, and the sight perhaps of ruined walls dark against the twilight sky, weave gusle music into heart music, and the spirit of long-ago creeps out to envelop the dancing forms. We see again in the light of the past the scarlet trains, the golden spears, and the bright,

white tents of sultan hosts. We lay up memories of jeweled women, nine pendants hanging from resplendent breasts, as relics of bygone days, when sultans saluted their slaves with surreptitious kisses in the shadow of tents, and heroes rode fearlessly, carelessly forth on steeds that were silk-saddled and black with the pelt of the bear. We ask ourselves as we peer in the past, Do we yet today in our dreams of self, so ride and kiss and laugh in tents composed of the stuff of our moods?

NEW YORK UNIVERSITY

POTTERY FROM CERTAIN CAVES IN EASTERN SANTO DOMINGO, WEST INDIES

By THEODOOR DE BOOY

IT was the privilege of the author to conduct certain archeological investigations in the Republic of Santo Domingo during the months of July to October, 1913, in behalf of the Heye Museum of New York City. This expedition confined itself mainly to the eastern part of the Republic, with headquarters first on Saona island and later in the woods near Cape Macao, in the vicinity of a small settlement called Salado (fig. 12).

Both Saona island and the district of Macao are virtually a virgin field to the archeologist. In the numerous general accounts and the comparatively few archeological writings on the island of Santo Domingo the author was able to find only a single mention bearing on the antiquities of the region. This is in a paper by Sir Robert Schomburgk, who makes brief reference to the shell-heaps of Cape Engaño, a promontory south of Cape Macao,[1] but does not state whether he made further investigation.

Early History

While information respecting the archeology of these regions is meager, one can find in early historical writings a certain amount of data on Saona island, the district of Macao, and in general on the eastern portion of Santo Domingo.

After Columbus had coasted the southern side of Jamaica on his second voyage, he steered eastward and soon saw the coast of Haiti rising above the horizon. He did not know which island this was, as he was familiar only with its northern coast, but on skirting the southern coast he found that he had returned to Hispaniola, when an Indian came off in a canoe to his ship, hailed him by name, and spoke to him in Castilian.[2] The Admiral continued eastward

[1] Schomburgk, Ethnological Researches in St. Domingo, *Report of British Association for 1851*, pp. 90–91.

[2] Irving, *Life of Columbus*, book VII, chap. vii.

along the coast, and, passing the islands of Beata and Alto Velo, finally reached Saona and anchored in the channel between that isle and the mainland. Saona was called *Adamano*, or *Adamaney*, by the natives.[1] No mention is made by historians whether or not Saona was found to have inhabitants when Columbus was lying in the channel between it and the mainland, and the author can find no mention of the origin of its present name, Herrera merely men-

FIG. 12.—Map of eastern Santo Domingo, showing the route traversed.

tioning that the Castilians thus called[2] it, while Las Casas thought the name *Saona* was applied to it by the Admiral or the Adelantado, but does not give the reason.[3] In Irving's *Life and Voyages of Christopher Columbus*,[4] we find the following statement: "He [Signor Belloro] states that a public square in that city bore the name of Platea Columbi, towards the end of the 14th century: that

[1] Herrera, *Historia General de las Indias*, dec. I, lib. II, cap. xv. Las Casas, *Hist. Ind.*, lib. I, cap. xcviii.

[2] Herrera, op. cit.

[3] Las Casas, op. cit.

[4] Appendix, note VI, "The Birthplace of Columbus."

the Ligurian government gave the name of Jurisdizione di Colombu to that district of the republic, under the persuasion that the great navigator was a native of Savona, and that Columbus gave the name of Saona to a little island adjacent to Hispaniola, among his earliest discoveries." This, then, may be the origin of the name of the island, for while Irving says that the proofs which Signor Belloro brings forward to show that the Admiral was born in Savona are fallacious, he does state that the records show that the father of Columbus was for a long time resident of the town named. It may therefore well be that Columbus named the island in memory of his father.

We next find in the ancient chronicles that Saona was frequently visited after the establishment of the city of Santo Domingo on the southern coast of Haiti, and that the inhabitants of this settlement held constant communication with the natives of the island in order to obtain cassava bread. These relations appear to have been friendly for some time, and the aborigines of Saona readily supplied their visitors with provisions.[1] Owing to the customary Spanish cruelty, however, this condition of affairs did not last long. On one occasion a party of Spaniards came to Saona in a shallop and were well received as usual. It so happened, however, that one of the bloodhounds which accompanied the soldiers saw the cacique of the island moving about with a staff in his hand, directing the activities of his followers who were loading the Spanish vessel. The dog, under the impression that the cacique was making threatening motions, strained at his leash, and the Spaniard holding the animal, thinking to have some sport, released the hound, which forthwith sprang at the chieftain and killed him. The enraged followers fell upon the Spaniards and killed eight of them before the remainder could escape to their boat.[2]

This occurrence being reported in the city of Santo Domingo, orders were given to Don Juan de Esquibel (who at the time was about to undertake an expedition of conquest against the inhabitants of the Higuey district, to whose chief cacique, Cotubanama, the cacique of Saona owed allegiance) to make a special

[1] Las Casas, op. cit., lib. II. cap. vii.

[2] Ibid.

trip to Saona in order to avenge the death of the eight Spaniards. Esquibel had with him a party of about 350 men, some of whom were sent to Saona.[1]

The scenes following the landing of this expedition baffle description. The Indians, on discovering the hostile intentions of the invaders, gave battle, but to no avail: their arms were of small use against the cuirasses of the Spaniards, and their stone weapons no match for the swords and spears of their enemies. After great slaughter the surviving Indians retreated to the hills and caverns, but even here they were pursued, and Las Casas mentions that about 600 or 700 of them were found in one place and put to the sword. We must here make allowance for the historian, as it is not likely that so many Indians lived on Saona island or that they were found in one "casa" (house), as related by Las Casas, who received his information from hearsay and probably was misinformed respecting the number of Indians mentioned. Nevertheless, after this expedition no aborigines remained on Saona; such as were not killed were taken as slaves and the island depopulated.[2]

The early writers make one more mention of Saona island. After the second war on the inhabitants of Higuey, Cotubanama, the cacique of that district, fled to Saona with his wife and children and a few followers, who hid themselves in some caves in the interior.[3] Another expedition was sent to capture Cotubanama, and he was finally made prisoner and taken to Santo Domingo City, where he was hanged by order of Ovando.[4]

From all accounts Saona appears not to have been inhabited after the massacre of its native inhabitants about 1502. The author has been able to find only one account to the contrary; this is in a modern work by Samuel Hazard, but no original authority can be found in support of his statement.[5] This author says: "The course of the steamer being now entirely changed, she heads almost due west, and we pass the island of Saona, once famous in the annals

[1] Las Casas, *Hist. Ind.*, lib. II, cap. viii.

[2] Ibid.

[3] Ibid., cap. xvii.

[4] Ibid., cap. xviii.

[5] Samuel Hazard, *Santo Domingo, Past and Present: with a glance at Hayti*, New York, 1873, p. 207.

of the Jesuits as a place where they held exclusive control over fertile fields. It is as large as the Dutch island of Curacoa and said to be infinitely more fertile, though now desolate and unproductive." It cannot be urged that Mr Hazard may have meant that the period of "exclusive control over fertile fields" antedated the massacre of the Indians, as the Jesuit order was not established in Europe until 1534, whereas the massacre of Saona took place about 1502; and even if the Jesuits had settled on the island in later years, some traces of their occupancy, such as the walls of houses or the walls surrounding fields, would be visible. While the present writer did not visit the western portion of the island, he saw no evidence of such occupancy in the eastern half. Several fishermen from the village of Bayajibe, on the adjacent mainland, assured him that they had often walked through the interior of western Saona and along its shores, but had never seen any remains of buildings.

The history of the district of Macao and Higuey is essentially the same as that of the island of Saona, so far as the aboriginal inhabitants are concerned. Bloodshed, rapine, and wanton destruction of agricultural property, the main resource of a non-mineral country like the district of Macao, mark the brief period of existence of the Indians after the Spanish invasion. When the Spaniards established their rule on Haiti, the eastern portion of the island was known by the Indian name of Higuey and was ruled by the powerful cacique Cotubanama. The inhabitants of this province were the most warlike of the island, having become proficient in the use of defensive weapons probably through the frequent invasions of the Caribs from the neighboring islands to the eastward. The cacique himself has been described by Las Casas, who refers to him as the strongest and tallest man of his tribe; that his bow was so strong that a common man could not bend it, and that his other weapons resembled those of a giant.[1]

About the time of the killing of the eight Spaniards by the inhabitants of Saona, the Indians of Higuey province, under the leadership of Cotubanama, revolted against Spanish rule. Their relations with the invaders had already become strained, owing

[1] Las Casas, *Hist. Ind.*, libro II, cap. xvi.

to the demands made upon them; and for some time they had been aware that their first conception that the Spaniards were supernatural beings was a delusion. A Spanish officer, Juan de Esquibel, was dispatched by Ovando from Santo Domingo City in 1504 to punish the natives, and after a few insignificant defeats Esquibel succeeded in driving the Indians to the mountains; but the luckless people were doggedly pursued and systematically killed whenever discovered.[1] Finally, in desperation, the natives sued for peace, which was granted them on harsh terms: they were to cultivate land for the invaders and pay tribute in provisions. Esquibel built a wooden fort in an Indian village near the sea, probably where now is the pueblo of Higuey, and left in it a guard of nine men under Captain Martin de Villaman, who was supposed to collect the tribute and to enforce the cultivation of the land.

This peace was of short duration. The resident Spaniards of Higuey, following the usual practice, treated the Indians with great cruelty, made demands on them to which they could not accede, while women were taken from their husbands and fathers, and abused. Driven to desperation the Indians rose against the Spaniards, set fire to the fort, and killed the defenders.[2] This revolt forced the Spanish governor to organize another expedition against the natives, again under the command of Esquibel.

Las Casas, then a young man of twenty-eight, was a witness of the greater part of this second campaign, and while it was not until twenty-five years later that he commenced to write his history of the West Indies, a work which was not finished until he was eighty-five years of age, the cruelties of this campaign made such a vivid impression on him that oftentimes he thought the scenes he witnessed were the result of an unhappy dream. It is not necessary here to recount the atrocities committed by the conquerors: the murder of women and children, the burnings at the stake and other revolting tortures committed by the Spaniards on a people that had every right to defend their native soil. The entire population of Higuey was exterminated, with the exception of the chief Cotubanama, his wife, children, and a few retainers, of whose fate we have already

[1] Las Casas, *Hist. Ind.*, libro II, cap. viii.

[2] Ibid., cap. xv.

learned. Nor is it the purpose to discuss at greater length the history of the primitive inhabitants of this region, but merely to point out such connection as existed between Saona island, Higuey, and the district of Macao, which localities were undoubtedly inhabited by people of one tribe. The early accounts of these regions are of great interest to students of the history of early Spanish settlements in the New World, and it would be difficult to find in all history anything like the atrocious means by which the complete annihilation of the aborigines of the West Indies was effected.

Saona Island and its Archeology

The island of Saona was surveyed in 1902 by the staff of the U. S. gunboat *Dolphin*, under Lieutenant-Commander Albert Gleaves, and an excellent chart (Hydrographic Office chart 2106), embodying the results of the survey, was published. At the present time the island is uninhabited; but this is not to be wondered at, inasmuch as it is not fertile, it is the resort of an unbelievable number of insects, and its eastern part is completely devoid of

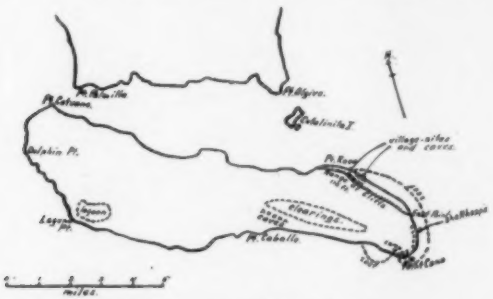


Fig. 13.—Map of Saona Island.

potable water. The author was told by fishermen who occasionally visit the island in order to find shelter for a night or to salt and sundry their catch, that in the western portion of Saona can be found a few wells, but that the water is almost undrinkable on account of the lime contained in it.

From San Pedro de Macoris, on the mainland, the author, accompanied by William Godet, a Turks Islander who accompanied

the expedition in the capacity of handy-man, proceeded to the small fishing village of Bayajibe where a sailing vessel was chartered to take the party to a point on the southern coast of Saona, one mile to the westward of Point Cana (fig. 13). This is one of the few spots suitable for pitching a tent and establishing camp. There is a brackish lagoon within half a mile of the shore, and there is also a well the water of which can be drunk in case of absolute need. This also is the nearest available camping spot to the eastern coast of

FIG. 14.—Sandy southern coast of Saona.

Saona. The entire southern coast has a sandy beach (fig. 14), while the entire eastern and northern coasts are of a coral formation (fig. 15) on which one can neither effect a landing nor erect a tent, there being neither trees of any size, nor soil. The author and his helper remained on the island sixteen days, during which time the chartered vessel called twice with a supply of drinking water.

The necessaries of life which one finds on Saona are few, an occasional wild pigeon and a fish or two being the only articles of food that were not imported. But while food is scarce on Saona,

so much cannot be said of animal pests, mosquitoes, sandflies, centipedes, scorpions, and a particularly vicious variety of wasp being found in great numbers on the beach and in the interior. At times mosquitoes and sandflies especially were so bad that it was impossible to enter the bush on the southern side of the island. Fortunately the greater part of the work to be done was in the neighborhood of Point Roca, where hardly any of these pests were to be found; perhaps it was for this reason that the aborigines had

FIG. 15.—Typical coral formation on eastern coast of Saona.

their villages around Point Roca, and that they merely visited other localities to cultivate their crops, to build and keep their canoes, and to dive for conchs, an important article of food. It was often necessary for our little party to retire before sunset and not to get up until an hour after dawn, a trying ordeal when one considers that sleeping under a cheese-cloth canopy, in order to keep out the tiny sandflies, has much the effect of a Turkish bath. It was not possible to transport the tent and the rest of the camp outfit to Point Roca through the dense brush and over the honeycomb coral,

and as there is no landing place on the eastern coast of the island, transportation by boat is out of the question.

Saona is 12 miles long and 3 miles wide, at the widest point, with an area of about 25 square miles. The rocky parts of the coast consist of the characteristic honeycomb coral, but the southern coast is chiefly a gently-sloping sandy shore. The greater part of the southern and eastern coasts is bounded by barrier reefs which are continually building up and forming new land. The bush on the eastern part of Saona is that characteristic of all West Indian coral islands, but the geological structure of Saona is different from that of the mainland, and is not unlike the Bahama islands. A great deal of the shrub consists of buttonwood, and there are also quantities of candelabra cactus and a species of small mahogany tree. The western part of the island is densely wooded, and there are said to be some valuable hardwood trees there. The interior of the eastern coast of Saona exhibits a remarkable phenomenon: the core of the island, some 116 feet high, has evidently been suddenly pushed upward by two distinct marine upheavals in preæolian times, and, as a result, in the top of the cliffs at Point Roca one finds caves formed by the action of the waves at a period when the core of island protruded only about ten feet above sea-level. After the first upheaval, other caves were formed in the base of the rocks, now about a hundred feet above the sea, when a second upheaval forced the core of the island upward another ten feet and

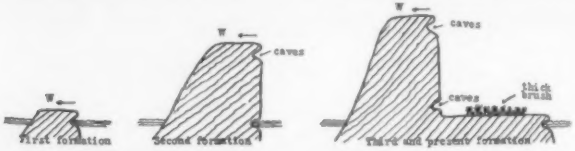


FIG. 16.—Eastern coast of Saona at different geological epochs.

formed the plateau now found between the high rocks at Point Roca and the sea (fig. 16). It was in this second range of caves, at the foot of the high cliffs, that abundant evidence of former aboriginal occupancy in the way of sherds, broken stone implements, etc., was found. It was necessary to blaze a way through the dense brush from the coast to the foot of the cliffs, a distance varying from half a mile to a mile.

One also finds on Saona, on a small bluff half a mile inland from the eastern coast, at East Point (see the map, fig. 13), the ancient foundation of a lighthouse that was never completed; the foundation is in good repair and could be used for a much-needed lighthouse to protect vessels coasting the shores of the Dominican Republic. No information regarding the structure could be gleaned from fisherman, but it is not unlikely that the work may have been commenced on the recommendation of Sir Robert Schomburgk, who made an extensive geographical survey of Santo Domingo in 1850–52.

The author made daily trips from the camp near Point Cana to points along the eastern coast, but during the first three days' sojourn on the island was unable to find any indication of former aboriginal occupancy, with the exception of scattered conch-shells with typical Indian perforations. In determining, throughout the West Indies, whether the aborigines had visited certain localities, the author has been greatly aided by an examination of old conch-shells (*Strombus gigas*) lying about. One often finds these shells in the interior of an island, sometimes as much as five or six miles from the sea; then again small heaps of the shells have been found on the coast, and they have been seen also in caves. Frequently the semi-fossilized condition of the shells indicates that they were opened in pre-Columbian times, but where the original pink coloring is preserved it is evident that they were taken from the sea at a comparatively recent date. There is one way, however, by which one can determine with certainty whether the shell was opened by a prehistoric or a post-Columbian inhabitant, and that is the condition of the aperture by means of which the conch was loosened from its shell and the meat extracted. If the aperture is a small round one (fig. 17), it is certain that the conch was opened and used by an Indian. The author has asked many West-Indians how the conch could have been taken from its shell in this way, as the hole is far too small to admit the introduction of an instrument like a knife to loosen the muscle from the inner convolutions. The modern conch-fisher makes either an elongate orifice in the shell of the type shown in figure 18, and then with a knife-blade loosens the muscle, or else with a hatchet knocks off the entire top of the

shell. After the muscle has been cut loose, the soft conch can be pulled through the mouth of the shell. No negro conch-fisher with whom the writer has ever talked, could explain how an Indian could have extracted a conch by making merely a small round hole, hence the process can be explained only by the theory that the pre-Columbian inhabitant caused the conch to release its hold on the shell by pouring boiling water in the aperture. Whatever the value of this conjecture, it is a fact that the difference in the apertures is an important guide in determining where the aborigines lived, and has proved of great value in our West-Indian explorations.

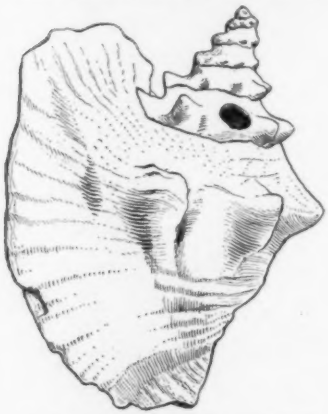


FIG. 17.—Conch-shell opened by an aborigine.

FIG. 18.—Conch-shell opened by a modern negro conch-fisher.

From Cuidado reef, at the extreme southeastern point of Saona, to a point half-way to the inland bluff called East Point, a distance of about a mile, one encounters, at no great distance from the sea, small heaps of conch-shells, and as no indications of an Indian village-site in the immediate vicinity is found, it is evident that the Indians came to this spot only to collect the conchs on the rocky shoals between the reefs and the beach, then to extract the meat from the shells, and to carry it, possibly after salting, to their habitations. Extensive excavations in some of these small heaps of shells mixed with brain coral (fig. 19) failed to produce potsherds or other artifacts.

The explorations were extended day by day farther to the north along the eastern coast, when finally, in cutting a path through the brush almost due west from a point on the beach about half a ilem from Point Roca, we found, at the very foot of the cliff, a large quantity of potsherds and some fractured stone celts (figs. 20, 21).

FIG. 19.—Deposit of conchs and brain coral.

As above stated, the cliffs at Point Roca, at a distance of half a mile to a mile from the shore, rise perpendicularly from a plateau about ten feet above sea-level and which is densely covered with brush through which one has to cut his way with a machete. The survey map above mentioned gives the actual height of Point Roca as 116 feet above sea-level. The cliff slopes gradually to the southward and still attains a height of about 100 feet at a distance of two miles from the northeasterly extremity of Saona. It is impossible to scale these cliffs directly at Point Roca, but half a mile from Point Roca, ascent is possible, though dangerous and difficult. The limestone is greatly weathered, and the rough surface, combined

with the small cacti which have found a hold on the almost sheer face of the cliffs, makes climbing an unpleasant task. No evidences of Indian occupancy were found on the high plateau; but this lack is not to be wondered at, since the vegetation is almost impenetrable and the rock formation such that walking is impossible. At the foot of the cliffs are a great many shallow caves, or, rather, overhanging shelves of rock. Caves are found also at the top of the cliff, but these are not accessible. After climbing the cliff, the author

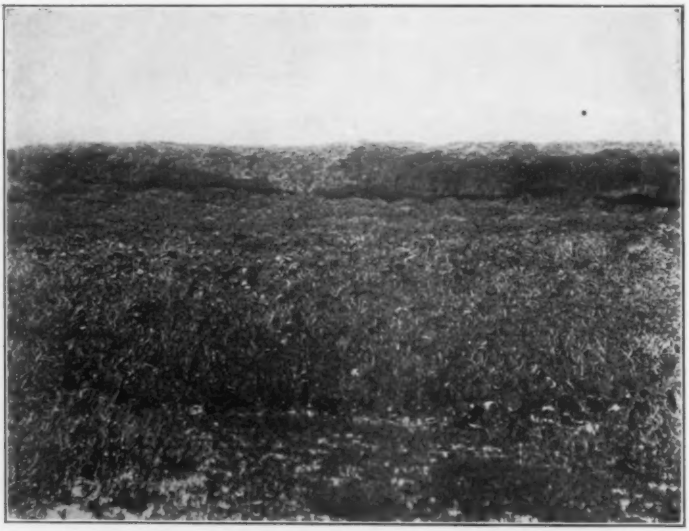


FIG. 20.—Dense brush between beach and inland cliffs.

attempted to descend into one or two of these caves with the aid of a rope, but as this was found to be impossible, the theory that the upper range of caves was used by the aborigines for any purpose may be dismissed as untenable.

Potsherds, chiefly fragments of cooking vessels, were found in several of the caves at the foot of the cliffs, but nothing was found to prove that these shelters were used for habitation, for burials, or as shrines. The sherds found here may be parts of

vessels left in the caves to collect water from the drip of stalactites. As previously mentioned, a large quantity of sherds was found at the foot of the cliffs outside of the caves, over an area of about two miles in length and about fifty yards in width. It might therefore well be that the aborigines had a village at the foot of the rocks and stationed sentinels on the summit to guard against invasion by enemies, and that in case of severe storms the inhabitants sought shelter in the numerous caves and under the shelving rocks.

FIG. 21.—Foot of inland cliffs and caves.

It cannot be said that the inhabitants of Saona were troglodytes, principally because in the caves explored in the interior of Saona no indication of Indian occupancy could be found. One of the most noteworthy finds among the potsherds collected along the base of the range of cliffs was a new type of neck of a water vessel, subsequently found in large numbers in the caves of the Macao district. This sherd possibly indicates that the aborigines of Saona were in the habit of going to some inland well for their drinking water,

since no potable water can be found within a radius of three miles from Point Roca, unless one excepts the drip, negligible in quantity, from the cliffs and the stalactites. It may also be stated that practically no shells were found in the area where the potsherds occurred, and that twelve broken petaloid celts were collected, of the usual Antillean type, but no entire ones were found.

No kitchen-middens were met with on the eastern part of Saona, but this condition is not unusual on these soilless coral islands. It is possible, however, that one might find middens and village-sites on the western half of Saona, because the presence there of large trees would indicate a supply of soil that preserves the hummocks upon which the Indian habitations were built and their accompanying refuse-heaps accumulated. It is hoped that further researches in the western part of Saona will be conducted.

Another village-site was found due east from the site under the rocks, within 20 yards of the shore. While not covering so extensive an area as the first site, a large quantity of sherds was collected, notably a number of the typical pottery heads of the general region.

Extended explorations were conducted also to the westward from the camp at Point Roca, especially in the interior and through the brush. The author was guided to some inland caves by visiting fishermen, but could find no remains in any of these.

While it is not desirable to theorize on the means employed by the Indians to protect themselves against the insect life found on Saona, one can picture the mode of life of its early inhabitants. It is known that their principal settlement can have been at no other place than the foot of the cliffs of Point Roca, judging from the occurrence of the large number of potsherds there; that they went along the shore to the southward to collect conchs, their chief food staple, and that undoubtedly they also caught fish on the shoals surrounding this part of the island. They doubtless stored their canoes on the southern beach, the only place where they could have effected a landing, as previously mentioned. There is no question that the Indians went to the interior to cultivate cassava and other vegetables, as this was not possible in either the rocky ground of the eastern coast or the sandy soil of the south. It may also be said that at practically all seasons the aborigines were prevented

from living in the interior, on the southern coast, and on such parts of the eastern coast as provided their supply of sea-food, owing to the innumerable mosquitoes and sandflies. These conditions, therefore, may have led to the selection of Point Roca as the most suitable abode, since this point is exposed to the southerly, easterly, and northerly winds (as may be known, there is no westerly wind ten times a year in the Antilles), and where in consequence mosquitoes are scarce and sandflies not found at all.

Whether or not the utia (*Capromys*) ever existed on this island is not known, but from the fact that skeletal remains of this animal were found in the kitchen-middens of the mainland, at Point Barbara, it is probable that it occurred also on Saona, although no bones were found on that island, possibly due to lack of soil. There are three species of non-venomous snakes on Saona.

In concluding this short report of investigations on Saona, it may be said that it is practically impossible to remain on this island for a considerable time without danger of serious illness from the stings of insects. In consequence it was deemed best to conclude the Saona work and to be contented, for the time being, with the exploration of the eastern half of the island, trusting at some future time to be able to explore the western portion by means of a vessel which at night could anchor far enough off-shore to be out of range of mosquitoes and sandflies. It will also be noted that in a later part of this paper no mention is made, nor illustrations given, of the potsherds collected on Saona. This is for the reason that in the explorations at Cape Macao so many sherds of similar type, but in better state of preservation and of larger size, were found, that the illustration and description of these apply to the Saona specimens as well.

Investigations near Salado and Cape Macao

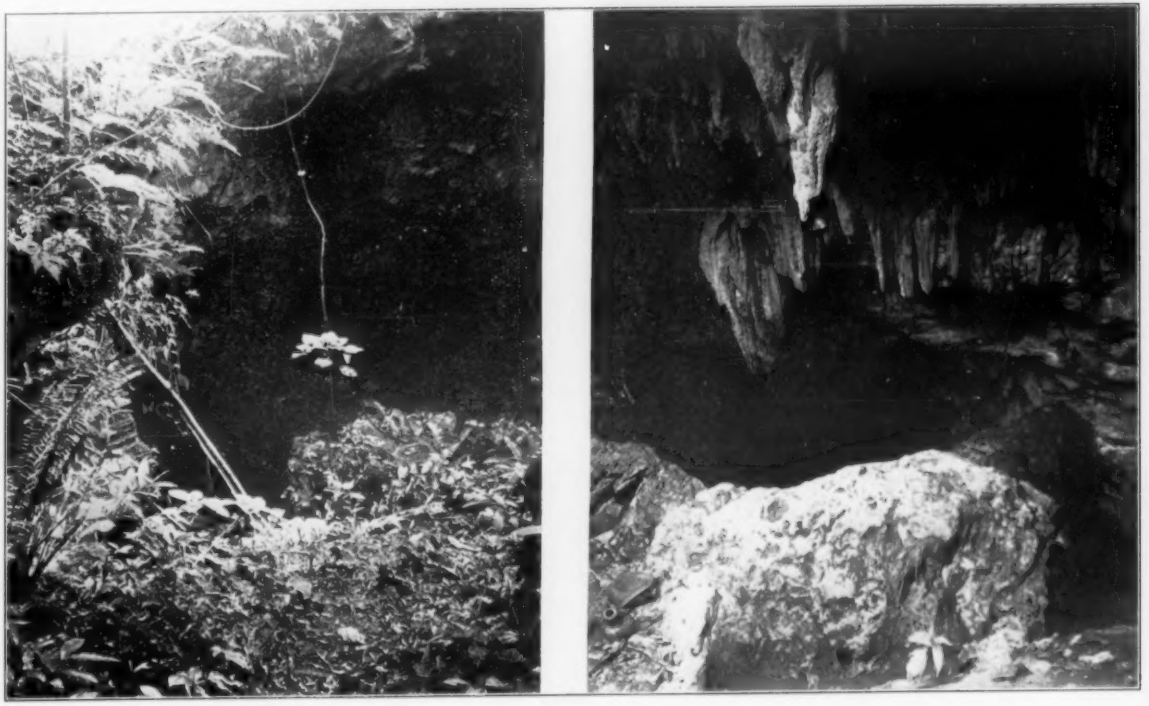
After leaving Saona, the author returned by the chartered sailing vessel to the fishing village of Bayajibe, where a pack-train was hired to conduct the party and its equipment to the pueblo of Higuey in the interior. From Higuey the author continued across the island to the cacao plantation of Mr F. Goussard, a French settler in this district, who generously placed his house at the disposal of the expedition. Mr Goussard's plantation is near Salado,

on the Anamuya river, about four miles from Cape Macao on the coast. While this gentleman was not residing on his property at the time, the author was fortunate in finding there Major Daniel Tenaille, a young Frenchman who had bought land in the neighborhood and who was stopping at Mr Goussard's plantation. The author takes this opportunity to extend his thanks both to Mr Goussard and to Major Tenaille for their hospitality and many courtesies during his stay in Santo Domingo, especially to Major Tenaille for the specimens found on his property and given by him to the Heye Museum.

The party spent three weeks at the house of Mr Goussard, and a similar period on the plantation of Major Tenaille. During this time we were enabled to explore thoroughly the Macao district and to conduct excavations at various sites. The usual mode of travel was on horseback, and comparatively good horses could be obtained for this purpose.

On Major Tenaille's plantation and the adjacent property it was our good fortune to find several caves which evidently had remained undisturbed since the annihilation of the aboriginal inhabitants. These caves are found in the midst of a virgin forest, within an area of a square mile (fig. 22). There can be no doubt that all these caves would be found to communicate, if one cared to open the tunnels which at present are too small to allow the passage of a human body. In the accompanying photograph (pl. IV, *a*, *b*) are shown the mouth and the interior of the first chamber of one of these caves. In all, eight caves were found, the openings sometimes being hidden in the dense forest, making it difficult to relocate them after they had once been left. Pottery was found in all these caves.

The caves explored are in the typical limestone formation of the West Indies. Two of them are quite large, and contain underground lakes of fresh water. It was in these two caves that the greater part of the pottery was found. Practically all of this earthenware was broken, due in part to the falling of slabs of limestone from the roof, and partly from having been thrown about by the original occupants; for example, in two instances parts of a vessel were found separated by a distance of ten yards or more.



a. Mouth of Cave

b. Interior of Cave

THE CAVES NEAR SALADO

There is every reason to believe that these caves had not been entered since the advent of the Spaniards, as they open on land that had been cleared only after Major Tenaille bought the property, and even then it was impossible to persuade the Dominicans of the laboring class to enter the caves unless accompanied by either

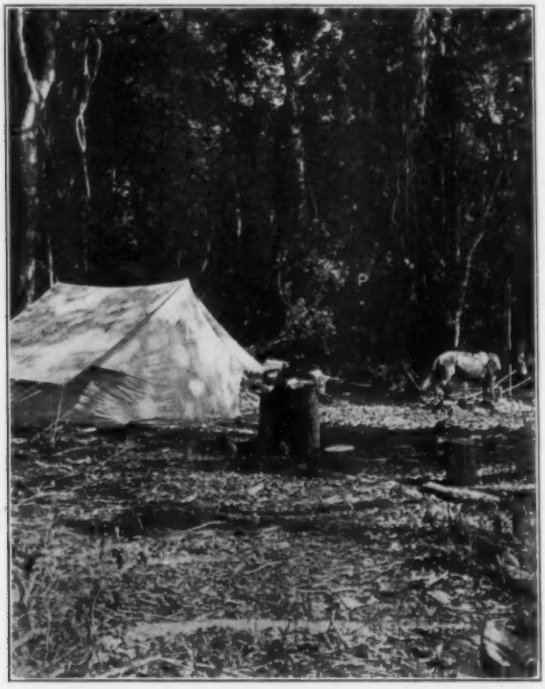


FIG. 22.—Camp near Salado, in the neighborhood of the caves.

Major Tenaille or the writer. In the two caves with the underground lakes a great many potsherds were lying in the water, some of which were recovered by diving on the part of Major Tenaille, the author, and Godet, our colored helper. A fragment in the lake bottom, in some places twelve feet in depth, was first located by burning a piece of magnesium wire; a long pole was then put in the

water alongside the sherd, and the diver, following the pole with one hand, recovered the pottery with the other.

Most of the sherds found were lying between the bowlders that cover the floor of the caves, and which, in the course of centuries, had fallen from the roof. Between these bowlders are small chambers and tunnels, making the thorough exploration of a cave a tedious task of several days. One cave especially was hard to explore, owing to the dense air in the bottom which made breathing difficult. The entrance of this cave has a downward slope of about forty-five degrees, and the lakelet at the bottom is not less than thirty feet lower than the mouth.

Chemical analysis of water from the cave lakes, made by Dr Frederick W. Zons, to whom the author wishes to acknowledge his indebtedness, indicates 975 parts per million of mineral matter, of which 550 parts are sulphates, and 216 parts oxide of lime present chiefly as sulphates. The mineral matter contains, in addition, considerable sodium sulphate and chloride, also 36 parts per million of iron and aluminium oxides, and 33 parts per million of silica (SiO_2). The water contains also 1010 parts per million of organic matter, but this of course may be of recent origin. The water is extremely unpalatable, and the author drank it only when his supply of rainwater was exhausted. The horses and mules refused to drink it, even after they had been without water for two days.

As has been said, the area in which these caves are found does not exceed a square mile. Taking this area as the limit of investigation, the author attempted to find the exact location of the Indian village-site, which presumably was within a short distance of the water supply. While odd fragments of pottery were found in the undergrowth within a radius of two miles of the caves, in no instance were they discovered in sufficient quantity to enable the exact determination of a former settlement, hence it cannot be said definitely that the Indians had a permanent abode in this vicinity. Furthermore, in view of the quality of the cave water, and the fact that typical village-sites and kitchen-middens are not found along the coast within a distance of eight miles from the caves, it is probable that the aborigines came to these parts only in the planting season, during which time they lived in temporary shelters.

a. Water Vessel

b. Part of an Effigy Vessel

EARTHENWARE FROM THE SALADO CAVES

The month of April, 1914, was likewise spent in the Macao district, with headquarters in the new house of Major and Mrs Tenaille, by whom the author was hospitably entertained. As in the case of the first expedition, much of the success of the second visit to this region was due to Major Tenaille, who had obtained from the natives much valuable information for the use of the author in the interim of his two expeditions. The caves were again visited, and a new range of caves was explored in the Peñon de la Vieja Rufina, near Cape Engaño. The Bonao district was also reconnoitered with the view of future work in the inland district.

Description of the Pottery

Perhaps the most interesting potsherd from the Salado caves is the top of a water vessel seemingly designed to serve as a filter. This fragment was found among the bowlders covering the sloping floor of one of the caves, and on careful examination several large pieces of charcoal were found in proximity to the sherd. Figure 23 shows the fragment in an upright position, while figure 24 pictures

Fig. 23.—Top of "filter jar."

Fig. 24.—Bottom view of "filter" jar."

the bottom of the specimen. In the latter illustration the "filter disk" can plainly be seen, dividing the upper part of the vessel from the lower, and figure 25 illustrates the probable appearance of the original vessel and the use to which it was put. The author

knows of no other specimen of this type, with the exception of one, also from the Salado caves and kindly presented by Major Tenaille to the Heye Museum; it consists only of the disk of a "filter jar," with the perforations, but shows clearly that it is of the same type as the specimen illustrated. The author considers it remarkable that the aborigines of Santo Domingo should have known the principle of filtering water through charcoal. It is difficult, however, to conceive what good it did the pre-Columbian inhabitants of Salado to filter their water through charcoal in this manner, as this process would not remove the lime, and the cave water does not contain other impurities necessitating its employment. The sherd illustrated is of yellow-brown clay, with a band of incised lines ornamenting the body and a conventionalized parrot-head serving to decorate one side. Height of specimen, 4⅛ inches (10.5 cm.).

FIG. 25.—Probable outline of "filter jar."

What must originally have been a well-constructed effigy vase is shown in plate v, *b*. Unfortunately the remainder of this excellent vessel was not found, otherwise it would rank as one of the most remarkable vessels from the West Indies. It is more than probable that the bottom part of this vase was globular and that it joined the effigy at the remaining edge of the under side. This vessel, which is of dark-brown clay, is of good workmanship and excellent finish. The details of the head are well executed, the nose, nostrils, eyes, and mouth being prominently shown, while the ears are fashioned in a conventionalized manner with incised circles. There is a slightly elevated ridge on the crown of the head, surrounding a circular opening which served for filling and emptying the contents. The upper part of the body, below the neck, is decorated with an

WATER VESSELS FROM THE SALADO CAVES

intricate, symmetrical, geometrical design which reminds one of that seen on the backs of wooden stools (*duhos*) found in certain parts of the Antilles, especially on the Caicos islands and the Bahamas.[1] Height of specimen, 7 inches (17.8 cm.).

One of the few entire vessels found in the Salado caves is shown in plate VI, *a*; it is of reddish-brown clay, is well finished, and in an excellent state of preservation, having only one small hole in the side. It was probably on account of this hole that the aboriginal owner discarded the water-jar, and, instead of breaking it to pieces, as appears generally to have been done, it was deposited between bowlders, where it was found by our party. The lower portion of this vessel, when found, was somewhat incrusted with a calcareous deposit, occasioned by the drip of the limewater from the roof of the cave. The top part of the neck of this vessel has a somewhat conical enlargement; the lower part is decorated with a grotesque head which, judging from the sunken eyes, may have been intended to represent a monkey, a not unusual feature of decoration in Antillean pottery. Eyes, nose, nostrils, and mouth are clearly shown by deep, incised lines and circles, and the top of the head is covered by a raised, cylindrical ornament with incised decoration. The ears appear to be divided into halves, with a deep pit in each half. On the reverse side of this lower portion of the neck of the vessel can be seen a convolute design in high relief, probably representing a snake. Two parallel incised lines surround the base of that portion of the vessel where the neck merges into the globular body: these lines are half an inch apart, and the space between is divided into four equal parts by four rectangular lines joining the two circles. In each of the four spaces thus formed, the potter cut another line parallel with the two circles and at an equal distance between them. This line in each case is almost a quadrant, and terminates at each extremity in a shallow pit made with the instrument with which the incised line was cut. Height of specimen, 14 inches (35.6 cm.).

The three necks shown in plate VII, *a*, *b*, *c*, belong to the same type of vessels as that illustrated in plate VI, *a*, and show varied ornamentation.

[1] Otis T. Mason, "The Guesde Collection of Antiquities in Pointe-a-Pitre, Guadeloupe, West Indies," *Smithsonian Report for 1884*, fig. 202d, p. 828.

Specimen *a* is a highly conventionalized head, showing only the outline of the face in a raised band; it has oblique eyes and a perforated nose. Height of specimen, 5 inches (12.7 cm.).

Neck *b* is more elaborate: the spout is ornamented with a design of incised circular lines, terminating in shallow pits, after the usual Antillean fashion, which possibly represents a type of head-ornament. The face is fairly-well fashioned, with slightly oblique eyes and two very prominent nostrils. The ears, like those of the vessel shown in plate VI, *a*, are divided into halves and have a shallow pit in each half. Height of specimen, 4 inches (10.2 cm.).

The third specimen (*c*) differs slightly in that the neck is more elongate and the head is modeled in higher relief. The ears are of the same type as those of specimen *b*, and the eyes and mouth are represented by deeply incised lines. The nose stands out prominently from the face. Height of specimen, 5¾ inches (14.5 cm.).

A simple water vessel, derived from the gourd, or calabash, can be reconstructed from the sherd shown in plate VIII, *a*. This specimen is of light-brown clay, is well modeled, and is without ornamentation. Height of specimen, 4½ inches (11.4 cm.). The gourd motif appears to be the fundamental form of the ancient water vessels from Santo Domingo.

The tops of more elaborate vessels, of which the form of the body is derived from the gourd, are shown in plate VIII, *b*, *c*, *d*, and in figure 26. These sherds may be described as belonging to the double-gourd type of vessels, the body of the jar representing one gourd, while the top simulates a smaller gourd superimposed on the larger one. This is especially noticeable in plate VIII, *c*, a sherd decorated also with two monkey-heads which served as lugs or handles. This specimen is 5½ inches (13.9 cm.) in height.

Plate VIII, *d*, is part of a highly decorated vessel, the spout of which is lacking. The upper part of the neck is ornamented with a series of geometrical, incised lines, and also with two highly conventionalized heads which served as handles. Height of specimen, 6 inches (15.2 cm.).

Plate VIII, *b*, exhibits a sherd of similar design, with two conventionalized heads and a raised band forming a V-shaped decoration on each side of the neck. Height of specimen, 6 inches (15.2 cm.).

a *b* *c*

Spouts of Water Vessels

d

Neck of "Mammæ type" of Vessel

e

Fragment of Food Bowl

POTTERY FROM THE SALADO CAVES

Figure 26 illustrates another highly decorated neck, with straight-line and circular incisions, and two conventionalized heads. The spout of this vessel terminates in a somewhat conical enlargement, like that of plate VI, *a*. Height of specimen, 7 inches (17.8 cm.).

Another type of jar was found, having a large flaring spout upon a gourd-shape body. In many instances this form of spout is provided with two handles, giving the jar a classical appearance not found in other West Indian water vessels. Two specimens are shown in plate VIII, *e*, *f*. Specimen *e* has the usual conventionalized heads which served as handles, and incised lines forming a decorative band between them. Height of specimen, 4 inches (10.2 cm.). Figure *f* originally had two handles, broad and flat, joining the body of the vessel and curving over, forming a junction with the neck, and continuing around the latter in a raised band. This type of handle appears to be new in Antillean pottery. Height of specimen, 4 inches (10.2 cm.).

FIG. 26.—Neck of water vessel from Salado caves.

Two other entire vessels, besides the one shown in plate VI, *a*, were recovered from the Salado caves. One of these (pl. V, *a*) is the simplest form of the double-gourd type of water-jar and lacks even the most elementary form of ornamentation. The body of the vessel is globular, narrowing into a neck superimposed by a conical spout. This specimen is of dark-brown clay of a poor quality, and is 8 inches (20.3 cm.) in height. The other vessel (pl. VI, *b*) was recovered, by diving, from the lake in one of the caves. When first seen in the water, the vessel was entire, possibly having slipped out of an Indian's hand while being filled with water. On coming to the surface with the vessel, the diver accidently struck it against a projecting rock, breaking it, but the missing part was

recovered after further diving. The jar was in an extremely poor condition from long soaking, and showed a tendency to crumble at the slightest touch. Despite every precaution in packing, the specimen arrived broken into about fifty pieces. It was, however, finally mended and now ranks as an important accession to the Santo Domingo collections. This vessel, which is of yellow clay, has a flask-shaped body; the neck is ornamented with two small lugs. Height of specimen, 9 inches (22.9 cm.).

The author collected a few fragments of vessels of the mammæ type described by Dr Fewkes,[1] but was not fortunate enough to be able to procure an entire specimen of this shape. Plate VII, *d*, shows enough of one of these vessels, however, to admit of the reconstruction of the original jar. An attempt to model and incise a human face has been made on the neck of the vessel, and two conventionalized heads are added to serve as handles or lugs. The spout has the conical enlargement noted in a few other specimens. In the object illustrated, these extensions are not tipped with a nipple, as in the specimen figured by Dr Fewkes; otherwise the jar is similar. Height of specimen, 7 inches (17.8 cm.).

The writer does not attribute any phallic significance to the fact that the lateral extensions of such vessels resemble mammæ and that the shape of the necks may suggest a phallus, as noted by Dr Fewkes. This author does not definitely state that this similarity has a phallic meaning, merely saying that it suggests phallicism. The resemblance referred to was justified at the time Dr Fewkes wrote, inasmuch as other specimens with this form of neck had not been described. As the present writer, however, was so fortunate as to find a number of fragmentary vessels with necks bearing more or less resemblance to phalli, regardless of whether the vessel was of a "mammæ type" or a "gourd type," he does not consider that the form of the neck has any bearing on the fact that the "mammæ type" of vessel has two breast-like terminations.

Practically no pottery, other than water vessels, was found in the caves of Salado. A few fragments of heavy clay griddles, such

[1] J. Walter Fewkes, "The Aborigines of Porto Rico," *25th Annual Report of the Bureau of American Ethnology*, 1907, p. 186.

NECKS OF VARIOUS TYPES OF WATER VESSELS FROM THE SALADO CAVES

as the author has described in a paper on the archeology of Jamaica,[1] were found, and the sherds of a few cooking pots and eating bowls. One of the latter is shown in plate VII, *e*. This shallow bowl, of reddish-brown clay, is of graceful outline, with a broad, incurving rim, and resembles somewhat the boat-shaped vessels from Jamaica. The ends of the vessel extent slightly upward and each terminates in a conventionalized head. The rim is ornamented with incised lines, terminating in pits, in typical Antillean style. The lower part of the bowl is plain. Width of bowl between handles, 7½ inches (19 cm.).

In the Salado caves were found also a number of pottery objects resembling stamps. These may be classed in two varieties: (1) those

a *b*

FIG. 27.—Clay disks with incised design.

that are circular or oval and have an incised design on both sides (fig. 27, *a*, *b*), and (2) those surmounted by a raised figure on one side and with an incised pattern on the reverse (pl. IX and fig. 28). The circular specimens illustrated in figure 27 have the same incised design on each face. A number of objects of this type was found, including some oval in shape. The diameter of *a* is 3 inches (7.6 cm.), and of *b* 2 inches (5.1 cm.). It will be noted that the specimens shown in plate IX and figure 28 are surmounted by small animal figures with outspread legs, luted to the surface of the stamp. In the body of the animal, which is raised and hollow, the potter

[1] Theodoor de Booy, "Certain Kitchen-middens in Jamaica," *American Anthropologist*, N.S., vol. XV, no. 3, July–Sept., 1913, p. 434.

put certain small objects, such as seeds or stones, so that they served both as stamps and as rattles. The method of manufacture of these objects can be clearly seen in figure 28, *a*, as evidently the semi-globular clay covering of the stamp-rattle did not adhere to the body in the firing or else it afterward became detached. This specimen also enables one to observe that the potter first made the stamp, and then fashioned a shallow cup-like depression in the body of the animal surmounting it. The cup was then covered with a semi-globular disk of clay, some small seeds or stones being first placed in the cavity. The covering overlapped the edges of the lower part, and then was smoothed down until united with the stamp proper. Of the stamps illustrated, those shown in plate IX, *a*, and figure 28

a, Obverse. *b*, Reverse.

FIG. 28.—Clay stamp from the Salado caves.

are circular, and those in plate IX, *b*, *c*, *d*, rectangular. The reverse sides of the five stamps are exhibited in *a'*, *b'*, *c'*, *d'*, and figure 28, *b*. As will be seen, *a'*, *c'*, and *d'* have the same type of incised design as the flat disks shown in figure 27. Design *b'* is quite different, and to some extent resembles the swastika. Figure 28, *b*, also differs from any of the others in that it probably represents a highly conventionalized bird. Diameter of *a* (pl. IX), 2⅛ inches (5.4 cm.); width of *b*, 2¼ inches (5.7 cm.); width of *c*, 2¼ inches (5.7 cm.); width of *d*, 2¾ inches (6.9 cm.); diameter of *a* (fig. 28), 2⅛ inches (5.4 cm.).

One of the objects described above is figured in Dr Fewkes' report on the Aborigines of Porto Rico (plate LXXXVI, *b*, *b'*). The reverse side "suggests that it had a handle (now broken) attached to the middle," which handle probably was the body of an animal

a *a'* *b* *b'*

c *c'* *d* *d'*

CLAY STAMPS FROM THE SALADO CAVES

figure, of which the legs, shown by incised lines, can still be seen. One may also observe two incised lines, resembling antennæ, which suggest that the animal intended to be represented by the potter is an insect of the Coleoptera family.

This account does not include a description of many water vessels of the same type, but with slight variations as to design and ornamentation, from the Salado caves. Extended description of these would be out of place in this report, but will be considered in a later publication.

THE HEYE MUSEUM
NEW YORK CITY

SOUTHERN PAIUTE AND NAHUATL—A STUDY IN UTO-AZTEKAN. PART II[1]

By EDWARD SAPIR

SUPPLEMENTARY Note on Uto-Aztekan o.—In pp. 399 and 400 of Part I of this paper examples were given of Nahuatl and Sonoran *o* corresponding to Southern Paiute open ɔ (Ute ŏ) as distinct from Southern Paiute close *o*, *u* (Ute *o*, *u*), which also corresponds to Nahuatl *o*. We suspected that Nahuatl *o*: Shoshonean *o* represented a Uto-Aztekan vowel distinct from Nahuatl *o*: Shoshonean ɔ, and found confirmatory evidence for this in Cora. Before definitely positing a Uto-Aztekan ɔ, however, I stated that "more evidence, based on more carefully recorded material (as regards vocalic qualities) than is generally available for comparison, is highly desirable."[2] Since these words were penned the required evidence has appeared in the shape of Juan Dolores' "Papago Verb Stems."[3] It is clear from Dolores' material that whereas S. P. close *o* (*u*) corresponds to Papago *u*, the Papago *o* (doubtless an open vowel) is the regular representative of S. P. ɔ (Ute ŏ). The S. P.-Papago[4] examples noted of this latter correspondence are:

Pap. *oN*[5] "salt": S. P. ɔa- "salt"

Pap. *koi* "to sleep (sing.), die (pl.)": S. P. *qɔ'ɔi-* "to go to sleep (pl.)"

[1] Part I of this article appears in the *Journal de la Société des Américanistes de Paris*, N. S., X, 1913, pp. 379–425. It was the intention of the author and of the Société des Américanistes to publish Part II in the same journal, but owing to the war and the consequent unsettled condition of scientific work and publication in Europe, it has been impossible for Dr Sapir to obtain a response to his inquiries regarding the proposed publication in Paris, or whether, indeed, the manuscript of Part II of his article had been received. Therefore, to avoid further delay the remainder of his contribution will appear in this and following numbers of the *American Anthropologist*.—EDITOR.

[2] *Journal de la Société des Américanistes*, op. cit., p. 401.

[3] *University of California Publications in American Archaeology and Ethnology*, vol. 10, 1913, pp. 241–263. All Papago forms cited in this paper are taken from Dolores' work.

[4] Abbreviated Pap.

[5] Dolores' small capitals represent voiceless or aspirated sounds.

Pap. *noh* "to bend": S. P. *nɔq'ɔ-* "to bend"
Pap. *o'ohṭ* "sand": S. P. *aṭ'a-* "sand" (< **ɔṭ'a-*, cf. *taŋa-* "knee": < **tɔŋa-*)
Pap. *tohNÜ* "knee": S. P. *taŋa-* "knee" (< **tɔŋa-*); Tüb. *toŋo-*
Pap. *ovi'TĂI* "awl" (originally "little piece of wood" ?): S. P. *ɔvi-* "stick"
Pap. *oh* "back": S. P. *ɔā-* "back"; Ute *ōā-*

Examples of corresponding long ɔ̄ are:

Pap. *wōhPÜ* "to run (pl.)" (*wō-* < **pɔ̄-*): S. P. *pɔ̄ya-* "to run about"
Pap. *wō'KÜ* "trail," *wō'kah* "to have a trail": S. P. *pɔ̄-* "trail"

With these examples contrast such as:

Pap. *tĭuh* "to stop burning of itself": S. P. *tuγwi-* "fire goes out." Uto-Aztekan **toki-*
Pap. *wuI* "eye": S. P. *pu'i-* "eye"
Pap. *uI* "to have wind on the bowels": S. P. *ō-* "to break wind"
Pap. *u'uh* "war arrows": S. P. *ō'* "arrow"; Hopi *hò-hū;* Luis. *hu-la;* A. C. *hu-l.*

The combined evidence of Southern Paiute (and Ute), Papago, and Cora thus makes it certain now that open *ɔ* was a Uto-Aztekan vowel distinct from close *o* (*u*). Both seem to have fallen together into *o* (*u*) in Nahuatl. Shoshonean or Sonoran testimony will in many, if not most, cases, however, indicate which was the original Uto-Aztekan vowel. Thus, Nahuatl *tona* "faire chaud" (*tonatiuh* "sun") and *chocoa* "to cry" are proved to have originally had *ɔ*, not close *o*, in their first syllable by comparison with Papago *toN* "to shine" and *šohšah* "to cry" respectively (*šoh-* < **tšɔk-*, as will be demonstrated farther on).

(*b*) Consonants

The consonantal system of Southern Paiute is even more extensive relatively to that of Nahuatl than its vocalic system. As in the case of the Southern Paiute vowels, however, many of its consonants are only secondary forms of other, primary, consonants and, when thus recognized, must be referred to these latter when etymological comparisons with Nahuatl are instituted. Thus, the total number of Southern Paiute consonants that have to be directly accounted for in terms of Nahuatl consonants is considerably less than might at first blush appear. Before proceeding to a specific treatment of the Uto-Aztekan prototypes of the Southern Paiute and Nahuatl consonants, we must briefly review the consonantic systems of these languages.

Nahuatl Consonants.—The total number of distinct consonants in Nahuatl is not large. They are represented in the following table:

	Voiceless Stop	Voiceless Affricative	Voiceless Spirant	Voiced Spirant	Nasal	Voiced Lateral	Voiceless Lateral Affricative
Bilabial	p		W	w	m		
Dental (alveolar)	t	ts	s		n	l	ʟ
Prepalatal		tš	š	y			
Palatal	k				ŋ		
Labialized Palatal	kw						

Of these, *k* is regularly represented, in the Spanish orthography which has become the standard for Nahuatl, by *c* (before *a*, *o*, *u*, and consonants) or *qu* (before *e*, *i*); *kw* by *qu* (before *a*) or *cu* (before *e*, *i*); *ts* by *tz*; *tš* (*ch* of English *church*) by *ch*; *s* by *ç* (before *a*, *o*, *u*), *c* (before *e*, *i*), or *z* (before consonants); *š* (*sh* of English *ship*, at least approximately) by *x*; *w* by *u* or *hu*; *W* (approximately *wh* of English *when*, but, it would seem, regularly with *i*-timbre) by *-uh*; *ŋ* by *n* (only before *qu*, *cu* = *kw*, and *qu*, *c* = *k*); and ʟ by *tl*. Phonetic *p*, *t*, *m*, *n*, and *l* are so represented in Nahuatl orthography. *ll* is simply long or geminated *l*, resulting from assimilated *-lʟ-* (*-ltl-*), and need not detain us further.

Not all the sixteen consonants of the table are primary. *W* (*uh*) results, as we have already seen,[1] from original *w* followed by syncopated *a*, *e*, or *i*; *ŋ* from original *n* or *m* before *k*- sounds (*k*, *kw*). *š* (*x*) is in part apparently a primary consonant (e. g., *xalli* "sand," *xochitl* "flower"); in large part, however, it is a resultant of original *y* followed by syncopated *a*, *e*, or *o*,[2] of syncopated *i*,[1] or of original *s* followed by syncopated *i*.[3] *tš* (*ch*) is in large part a primary consonant (e. g., *chocoa* "to cry," *chiua* "to make"), in part a resultant of original *t* followed by syncopated *i*.[3] It may turn out ultimately that all cases of apparently primary *š* are really resultants of original *s*. There are thus only fourteen, or even thirteen, Nahuatl consonants that need to be directly treated from a comparative standpoint.

[1] Part I of this paper, pp. 417, 418.

[2] Ibid., p. 417.

[3] Ibid., p. 418.

The so-called "saltillo" (indicated by ` over vowels) should also be reckoned as one of the Nahuatl consonants, as shown by its phonetic treatment (e. g., *pìlli* "older sister," with *-tli* as in *tlantli* "tooth," not with *-tl* as in *tepetl* "mountain"). Carochi's account of it seems to indicate clearly that the saltillo is a glottal stop: "The (`) indicates the pronunciation which they are accustomed to call saltillo (little jump), for the vowel on which this accent falls is pronounced as though with a jump or hiccough or difficulty and with a halt. . . ."[1] However,[2] the saltillo does not seem to be pronounced alike in all Nahuatl dialects, those of Oaxaca (Tuxtepec, Pochutla) making use of a voiceless mid-palatal spirant (*x*) instead of the glottal stop (e. g., *ox-* "road," instead of *o'-*, generally written *ō-*). The salto (indicated by ^ over vowels) occurs only at the end of a word and regularly turns into the saltillo when the suffixing of another element removes it to the interior of the word. It seems to differ hardly more than orthographically from the saltillo; perhaps, as its name ("jump") indicates, it sounded more forcible to Spanish ears than the saltillo because it abruptly ended the word. The etymological value of the saltillo will be discussed farther on.

Southern Paiute Consonants.—Every Southern Paiute consonant, except *s* and *š*, which are always completely unvoiced, appears in two forms—a voiced or, for stops, unvoiced but unaspirated form, and an unvoiced and markedly aspirated form; *y*, however, when unvoiced, unites as *i* with a preceding vowel, the resulting diphthong being followed by aspiration (thus, *pa* is related to $p^{\iota a}$ as *aya* to $ai^{\iota a}$ or ai^{ι}). The unaspirated (voiced) consonants are used before voiced vowels, the aspirated (unvoiced) consonants before voiceless vowels.[3]

Initially and after voiceless vowels stopped consonants appear in their simple or primary form, unaspirated or aspirated (according to

[1] "La (`) es señal de la pronunciacion que suelen llamar saltillo, porque la vocal sobre que cae este accento se pronuncia como con salto ó singulto, ó reparo, y suspension."—Carochi, p. 402.

[2] As I have been informed by Dr F. Boas.

[3] The conditions under which vowels become voiceless in Southern Paiute have been already defined. See I, pp. 385, 386. Analogous sets of voiced (or partly voiced) and voiceless aspirated vowels and consonants occur also in Papago; see Kroeber's remarks in Dolores, *Papago Verb Stems*, p. 242.

the nature, voiced or unvoiced, of the following vowel) in the former case, unaspirated in the latter. These consonants are *p*, *t*, *ts*, *tš*, *q* (about midway in point of articulation between mid-palatal and true velar), and *qw* (labialized *q*, always felt as a simple sound); k^y, a palatalized form of *q*, regularly occurs after *i*- vowels, *k* before *i*- vowels (these must be considered as purely secondary forms of *q*). In aspirated form these are $p^{\cdot}$, $t^{\cdot}$, $tš^{\cdot}$, $ts^{\cdot}$ (generally heard as $ts^{\cdot}$), $q^{\cdot}$, $q^{\cdot w}$, $(k^{\cdot y})$. *ts* and *tš* are doubtless variants of one sound, *tš* occurring before *a*, *o*, *ɔ*, and *ï*, *ts* before *i* (compare *q*: *k*). Medially after voiced vowels this set of primary stopped consonants appears in one of three forms: geminated (or lengthened), spirantized (*tš* and *ts*, however, do not become spirantized), and nasalized; each of these three types may again be unaspirated (in part voiced) or, in final syllables, aspirated (and voiceless, except that aspirated nasalized stops do not lose voice in their nasal element). The geminated stops are $p^{\cdot}$, $t^{\cdot}$, $t^{\cdot}š$, $t^{\cdot}s$, $q^{\cdot}$, $q^{\cdot}w$, $(k^{\cdot y})$; in aspirated form: $p^{\cdot\cdot}$, $t^{\cdot\cdot}$, $t^{\cdot}š^{\cdot}$, $t^{\cdot}s^{\cdot}$ (this is generally heard as $ts^{\cdot}$, $s^{\cdot}$ assimilating to long *s*), $q^{\cdot\cdot}$, $q^{\cdot\cdot w}$ (which may also be interpreted as $q^{\cdot}W$, i. e., $q^{\cdot}$+voiceless *w*), $(k^{\cdot\cdot y})$. The spirant developments of the stops are *v* (bilabial, as in Spanish), *r* (moderately trilled with apex of tongue), (*tš*, *ts*), *γ* (voiced guttural spirant, about like *g* of North German *sagen*), *γw*, (γ^y, nearly but not quite *y*); in aspirated form: *φ* (voiceless bilabial spirant), *ʀ* (voiceless *r*), ($tš^{\cdot}$, $ts^{\cdot}$), *x* (like *ch* of German *Bach*), *xw*, (x^y, like *ch* of German *ich*). The nasally affected stops are *mp*, *nt*, *ntš*, *nts*, *ŋq*, *ŋqw*, $(ŋk^y)$; in aspirated form: $mp^{\cdot}$, $nt^{\cdot}$, $ntš^{\cdot}$, $nts^{\cdot}$ (generally heard as $nts^{\cdot}$), $ŋq^{\cdot}$, $ŋq^{\cdot w}$ (which may be interpreted also as *ŋqW*), $(ŋk^{\cdot y})$.

We cannot here go into the various rules as to when geminated, spirantized, or nasalized consonants are used, as that would lead us too far into the details of Southern Paiute phonology and grammar. Certain suffixes regularly appear in only one of the three forms (e. g., geminated *-q·a-*, verbal suffix denoting plurality; spirantized *-va-*, postpositive element "at"; nasalized *-ŋqï-*, indirective verbal suffix "for"); still others in either spirantized or nasalized form (e. g., spirantized *-vān·ia-*, nasalized *-mpān·ia-*, verbal suffix denoting futurity; the latter form is used after stems possessing a nasal consonant *m*, *n*, or *ŋ*); still others in all three

forms, there being no obvious rules as to which of these is demanded by a given stem (e. g., *-q˙ai-*, *-γai-*, and *-ŋqaí-*, verbal suffix "to have"; *-lï-*, *-rï-*, and *-ntï-*, participial suffix; *-p˙i-*, *-vi-*, and *-mpi-*, absolute suffix for body-part nouns). We have thus geminating, spirantizing, and nasalizing stems (stems with nasal consonants tend to belong to the last type, though there are also many nasalizing stems that possess no nasal consonant, e. g., *ovi-* "stick," *aγo-* "tongue"). When two stems are compounded, the second has its initial consonant, if it begins with one, geminated, spirantized, or nasalized, according to the character of the first stem. Thus, from *qan˙ᵢ* "house" are formed *aŋqá-γan˙ᵢ* "red house" (*aŋqa-* "red" spirantizes), *tïmpí-k˙ᵛan˙ᵢ* "stone house" (*tïmpi-* "stone" geminates), and *ovi-ŋkᵛan˙ᵢ* "wooden house" (*ovi-* "wood" nasalizes); in the last two examples *-qan˙ᵢ* is at the same time palatalized to *-kᵛan˙ᵢ* because of preceding *i*. Suffixes also, in reference to such following suffixes as may have forms of two or all three classes, belong to one of the three types. Thus, adjectival *-q˙a-*, *-γa-*, *-ŋqa-* spirantizes, hence *aŋqá-γa-ʁ*ᴵ "being-red, red"; *-q˙a-*, *-γa-*, *-ŋqa-*, verb suffix "to have" (another form of *-q˙ai-*, *-γai-*, *-ŋqai-* already listed) nasalizes, hence *tïmpí-k˙ᵛa-nt*ᵛᴵ "having a stone."

Analogous to the stopped consonants is *m*. After vowels it is either geminated (or nasalized) to *-m˙-*, or spirantized to *-ŋw-*; aspirated forms are *m˙* and *ŋ˙ʷ*, in which *m* and *ŋ* are voiced, at least in part (initially, however, aspirated *m*, which stands before voiceless vowels, is entirely voiceless, *ʍ*). After vowels *n* regularly appears long, *-n˙-*; its aspirated forms, used analogously to those of *m*, are *n˙* and *ɴ*. Besides these two nasals must be listed also *ŋ* (*ng* of English "sing"), palatalized *ŋʸ*, with its aspirated form *ŋ˙*; it cannot occur initially. *w* and *y* have corresponding aspirated forms *˙ʷ-* and *˙ʸ-* when initial; postvocalic *w* is regularly nasalized to *-ŋw-*, aspirated *-ŋ˙ʷ* (thus, *-ŋw-* or *-ŋ˙ʷ* may go back to original *-m-* or *-w-*).

Postvocalic *s* and *š* are regularly long, *s˙* and *š˙*. There are no "spirantized" forms of *n*, *s*, and *š*. We shall see reason later on, however, to believe that original postvocalic non-geminated *n* disappeared; similarly, that original postvocalic non-geminated *s*, *š* became *'* (glottal stop). In other words, originally *p* : *v*, *t* : *r*,

q : *γ*, *m* : *ŋw*, *n* : zero, and *s*, *š* : ' were equivalent pairs. The latter two, however, are not now felt as equivalent pairs in Southern Paiute.

Glottal stops are rather frequent in Southern Paiute and of considerable grammatical importance. They are found not only medially between vowels but also initially (in which case the first syllable with short vowel counts as two moræ; e. g., *'at'ï-* "good," often heard as *ᵉ'at'ï-* with murmured *ᵉ-*) and finally. Frequently a glottal stop coalesces with a preceding stopped consonant, a glottalized stop resulting in which the glottal closure and release are synchronous with those of the oral chamber. Thus we have a new series: *p'*, *t'*, *t'š*, *t's*, *q'*, *q'w*, (*k'ʷ*), each of these again occurring in geminated and nasalized form (e. g., *p'·*, *mp'*). As glottalized stops, however, are of purely secondary origin in Southern Paiute, they need not, as such, concern us further in this study. The Southern Paiute glottal stop does not (except possibly in S. P. *nï'* "I": N. *nê* "I") seem to be historically connected with the Nahuatl saltillo (or salto).

Abstracting, then, from aspirated, palatalized, geminated, spirantized, nasalized, and glottalized consonants as being all of more or less secondary origin, we have left in Southern Paiute for specific comparison with Nahuatl consonants only *p*, *t*, *q*, *qw*, *tš–ts*, *š–s*, *m*, *n*, *ŋ*, *w*, *y*, and '.

Nasalized and Geminated Consonants in Shoshonean.—Before deciding what are the Uto-Aztekan prototypes of the primary Nahuatl and Southern Paiute consonants, we may ask whether it is possible to define the phonetic conditions, from a Uto-Aztekan point of view, under which consonants became spirantized, geminated, or nasalized in Southern Paiute (or Shoshonean generally). The spirantized consonants, which arose also in other Shoshonean dialects (e. g., Shoshone), are easy enough to understand; they doubtless arose regularly whenever a non-initial consonant came to stand immediately after a vowel.

The nasalized stops are to at least some extent also intelligible. In some cases, as we have seen, the nasal of the stem assimilated to itself the consonant of the suffix by affecting it with its nasal quality (e. g., *nïŋwu-ntsi-* "person"; *ᴺʷ'qwi-ntï-* "flowing, stream"; *taŋwa-*

mpi- "tooth"; *siŋwa-mpu-* "sand"); yet this is not observed in all such stems, even where the suffix frequently occurs in nasalized form in other stems (e. g., *mɔ'ɔ-vi-* "hand" with spirantized, not nasalized, form of suffix *-pi-*; *muvi-p'i-* "nose" with geminated form of same suffix).

We have already seen reason[1] to believe that the nasalizing power of *ɔvi-* "stick" goes back to an old nasal at the end of the stem that has disappeared as such. If *ɔvi-* (plus its nasalizing power) corresponds in all respects to N. *uapali-* "planche," we must suppose that final *i* of **ɔpin'i-* was syncopated and that *-n'-*, not being able to stand at the end of a word, could maintain itself only when followed by a stopped consonant, in other words, lingered on as a nasalizing peculiarity of the stem. There is no doubt, from comparative evidence, that there are several cases in Southern Paiute (and other Shoshonean dialects) of nasalized consonants resulting from the syncope of a vowel between an original nasal (*m*, *n*, or *ŋ*) and a stopped consonant. Such are:

S. P. *pa'a-nti-* "high" (< **pa'an'i-ti-*; *-nti-* is participial): N. *pani* "en haut, au sommet"

S. P. *tümpi-* "stone" (< **tüma-pi-*), *tiŋqan'i-* "cave" (< **tüma-qan'i-* "stone house"); Tüb. *dün-t* (< **düma-t*): Ser. (H.) *düma-t;* Git. *dümu-t*

S. P. *tuŋqut'û-* "to get clumsy" (< **tuma-qut'û-*): N. *toma-ua* "grossir, devenir gros"

S. P. *tümpa-* "mouth" (< **tüni-pa-*): Fern. *tōŋi-;* Cora *teni;* Pap. *tšihni*

S. P. *-šampa-* "only, except" (< **-šan* + some vowel *-pa-*): N. *çan* "only, but" (< **san* + some vowel). This example only implies syncope; at any rate, it clearly indicates that S. P. *mp* is etymologically *-n* (or *m*, for *-m* becomes *-n* in N.) + *p-*

S. P. *nɔntsi-* "to fly" (< **nɔn'i-tsi-*): Ser. (H.) *hinyi-k;* Cora *eni-te;* Pap. *nühni* "to fly up, fly away (pl.)"

S. P. *miŋqwā-* "(frightened animals) come out in one bunch" (< **min'i- qwā-*): N. *mi-miloa* "bouleverser" (< **mi-mili-wa*, reduplicated)

S. P. *naŋqá-va-φi* "ear," *naŋqa-q'ai-* "to hear" (< reduplicated **nanaqa-*): Fern. *nănak;* Tep. *nanaca.* Unreduplicated *naka-* is more common: N. *nacaz-tli;* Tar. *naka;* Pap. *nahkü*

S. P. *ampaγa-* "to talk" (< **am'ɔ- paγa-*): Pap. *amoh* "to talk loud" (< **am'ɔ-*)

In many cases, however, I can give no reason for the occurrence of the nasalized stop. Such are:

[1] Part I, p. 401.

S. P. *tuɣumpa-* "sky"; Shosh. *togumba-*; Tüb. *dogumba-l:* Möh. *duguba-t;* Gabr. *tukupa-r*
S. P. *paɣa-mpu-* "reed": Cora *haká;* N. *aca-tl*
S. P. *oɣo-mpu-* "fir": Cora *huku* "Kiefer": N. *oco-tl* "pinus tenuifolia"
S. P. *k'ʷi'ʲu-mpi-* "anus"
S. P. *wĭɣʌ-mpi-* "vulva"

This Southern Paiute (to what extent it is general Shoshonean cannot at present be stated) law of vocalic syncope in the neighborhood of a nasal consonant may explain also *-ɣai-* (*-q'ai-*, *-ŋqai-*) "to have" as compared with its participial form *-ɣa-ntĭ-* (*-q'a-ntĭ-*, *-ŋqa-ntĭ-*) "having," original **-kani-* regularly becoming **-kai-*> *-ɣai-* (see below under Uto-Aztekan *n*), while **-kani-tĭ-* with loss of *i* develops into **-kantĭ-*>*-ɣantĭ-*; similarly, perfective *-q'ai-* (as in *-q'ai-n'a-* "what has been -ed") as compared with its participial form *-q'a-ntĭ-* "having been -ed." Under what circumstances this vocalic syncope takes place is still undetermined.

Still another set of Southern Paiute nasalized stops is due to reduplication, inasmuch as stems with nasal as their second consonant reduplicate both first and second consonants; examples are *qaŋqán'ⁱ* "houses (distributively)" from *qan'ⁱ* "house," and *pumpun'ⁿⁱ'kᵘa'* "to see (plural subject)" from *puník'ᵘa'* "to see."

These three causes, then—assimilation to nasal of stem, syncope of vowel following nasal, and reduplication—may, in the present state of our knowledge, be advanced as responsible for the presence in Shoshonean of nasalized stops. They are clearly not, any more than the spirantal developments of stopped consonants, to be attributed to original Uto-Aztekan.

A far more difficult problem is presented by the geminated stops, which are known to exist not only in Southern Paiute but in other Shoshonean dialects as well.[1] As far as can be seen at present,

[1] In Northern Paiute, a dialect of the Mono-Bannock group, for instance, it is necessary to distinguish after vowels between lightly stopped fully voiced consonants (etymologically parallel to Shoshone, Ute, and Southern Paiute voiced spirants) and firmly stopped geminated consonants (see T. T. Waterman, *The Phonetic Elements of the Northern Paiute Language*, University of California Publications in American Archaeology and Ethnology, vol. 10, 1911, p. 33). In some Shoshonean dialects (e. g. Uncompahgre and Southern Ute) nasalized stops developed into geminated stops, thus falling together with the old geminated stops (see, e. g., J. P. Harrington, *The Phonetic System of the Ute Language*, University of Colorado Studies, vol. VIII,

Shoshonean geminated stops have exactly the same reflexes in Nahuatl and Sonoran as the simple stops (S. P. postvocalic spirants). Yet there is little doubt that we are here dealing with one of the fundamental points of Shoshonean phonology. Despite the very fragmentary data at hand, I believe it can be demonstrated that the geminated stops exist not only in Plateau Shoshonean but also in Tübatulabal and Luiseño-Cahuilla. S. P. *r*, the spirantal development of original *t*, is paralleled in these two Shoshonean groups by *l*; e. g., Tüb. *šulu-* "nail" <**sutu-* (cf. Tar. *sutu-*), Cahu. *kelawat* "wood" <**keta-* (cf. Fern. *kota*). Now it is extremely suggestive to note that the difference between the noun endings *-l* and *-t* in Tübatulabal and Luiseño-Cahuilla may be interpreted as due to the influence of a preceding spirantizing and geminating stem respectively. Thus, we are dealing with spirantizing stems in A. C. *hu-l* "arrow" (cf. S. P. *u-γun'a-* "quiver," literally "arrow-sack," *qun'a-* "sack" being spirantized to *-γun'a-* by preceding *u-* "arrow"); Cahu. *pa-l* "water," Tüb. *ba-l* (cf. S. P. *paγárï-ʁ*[1] "lake," literally "water-sitting," from *pa-*+*qarï-* "to sit"); Cahu. *eŋi-l* "salt," Tüb. *uŋa-l* (cf. S. P. *ɔa-vi-* "salt," *-vi-* being spirantized from *-pi-*); Tüb. *nüba-l* "snow" (cf. S. P. *nïva-vi-* "snow"); Cahu. *wewa-l* "rain" (cf. S. P. *uŋwa-rï-* "raining, rain" <original stem **uwa-* +spirantized form of participial *-tï-*). On the other hand, we seem to be dealing with geminating stems in Cahu. *duku-t* "wildcat" (cf. S. P. *t'ᵘ'qú-p'v-ts'* "wildcat"; *t'ᵘ'qú-m'umu-ts'* "panther," with *-m'-*, not *-ŋw-*); A. C. *alwa-t, alwu-t* "crow" <**atwa-* (cf. S. P. geminating *at'a-* in *'ª'tá-p'v-ts'*, *'ª'tá-q''wo-ts'* "crow"); A. C. *muu-t* "owl" (cf. S. P. *moó-p'v-ts'* "owl"); Tüb. *gu-t* "fire," Cahu. *ku-t* (cf. S. P. *qun'a-* "fire," with geminated *-n'-*; *qu-*, geminating verb prefix "by means of fire"); Cahu. *kumi-t* "smoke" (probably cognate with Mono (N. F.) reduplicated *gukuhi-p* "smoke," *-kuhi-* being identical with S. P. *kwî-*<**kuhi-* in *kwî-k'ᵛa-rï-* "smoke" with geminated form of *-qa-* suffix; Cahu. *-m-*: Plateau Shoshonean *h*, zero, is perhaps paralleled by Cahu. *yamiš-* "mountain": S. P. *qai-* in *qaiva-* "mountain" and Möh. *gai-tc* "mountain");

1911, in which no mention is made of nasalized stops, Harrington's material being taken from Southern Ute). These secondary geminated stops are naturally of no further interest here.

Cahu. *samu-t* "grass" (cf. Shoshone *sòni-p* "grass," Shoshone *-p* evidently corresponding to geminated form of S. P. *-vv-*, *-p'v-*, *-mpv-*, noun suffix regularly used for plants; for Cahu. *-m-*: Shoshone *-n-*, cf. A. C. *-tami* "knee": Tüb. *toŋo-*, Cora *tunu*). There is, as might indeed be expected, some conflicting evidence to contend with (e. g., Luis. *hunwo-t* "bear": Tüb. *una-l*), but I believe the case is strong that Luis.-Cahu. and Tüb. *-l* : *-t* corresponds exactly to the Plateau Shoshonean difference between spirantizing and geminating elements.

While, then, geminated stops doubtless form a fundamental class of sounds in Shoshonean phonology, we are quite at a loss, as already noted, to find reflexes for them in Nahuatl and Sonoran. The following examples illustrate this:

S. P. *t'ʷ'qwa-* "deep" = *tuq'a-:* Cora *tika-ntše* "in der Tiefe"

S. P. *tuγwa-* "to be dark, night" (< **tuka-*); Tüb. *duga-l* "night": Cora *tika* "Nacht sein"; Pima *tšoka-* "night"

S. P. *tuγwa-* "to put out the fire," *tuγwi-* "the fire goes out" (< **tuka-*, **tuki-*): N. *toquia* "attiser le feu"; Pap. *tšuh* "to stop burning of itself," < **tuki-*

Note that Cora *tika-* corresponds to both S. P. *tuq'a-* and *tuγa-*.

S. P. *tīγā-* "to measure, try": N. *teca* "poser des pierres, construire. pianter"; Pap. *tšüh* (< **tīka-*) "to put away"

S. P. *t'ʷ'qa-* "to eat" = *tīq'a-:* Pap. *tšüh* "to taste" (< **tīka-*)

Note that Pap. *tšüh* corresponds to both S. P. *tīq'a-* and *tīγā-*.

S. P. *t'ʷ'šu-* "to grind seeds" (< **tuš'u-*): N. *teci* "moudre le mais sous la pierre"; Pap. *tšui* "to grind" (< **tusi-*)

Note that Pap. *tšui* here corresponds to S. P. *tuš'u-* with geminated consonant, *tšuh* to S. P. *tuγi-* with spirantized consonant.

S. P. *ᴺ'qwi-* "to stream" = *nuq'i-:* N. *noquia* "verser une chose, avoir la diarrhée"

Note that N. *noquia* seems to rime perfectly with *toquia*, despite S. P. *nuq'i-*: *tuγi-*.

S. P. *šī-* "cold," regularly geminating following consonants: N. *ce-tl* "glace"; Pap. *hü-hpih* "to become cold"; Cora *sē* "es is kalt"

In the following examples, S. P. *š'* and *q'* (?) correspond to Pap. *hh*. Whether this is of any consequence as regards our problem I cannot say, though I should hardly be inclined to attach much importance to it.

S. P. *t'ʷ'qúa-ɸ'* "meat" = *tuq'ua-:* Pap. *tšūhhu'kŭ* "meat" (< **tuk'u-*?)

S. P. *q'ʷʷ'šǐ-ɸ'* "tail" < *qwašǐ'i-:* Cora *kwasí* "der Schwanz der Tiere"; Pap. *pahhi* "tail" (< **kwas'i*)

So far, we must conclude, the existence of a definite series of geminated stops has been demonstrated only for Shoshonean. These, then, like the nasalized stops, must be considered a specifically Shoshonean development (or Uto-Aztekan feature retained only in Shoshonean?).

Uto-Aztekan Consonants

Comparison of Nahuatl, Sonoran, and Shoshonean consonants leads to the setting up of fourteen, possibly only twelve, distinct consonants. These are *p*; *t*; *tl*; *tš* (of which *ts* may be considered as variant); *k*; *kw*; *s* (of which *š* may be considered as variant); *m*; *n*; possibly *ŋ*; *l*; *w*; *y*; and possibly *h*. It is very doubtful if also the glottal stop (') is to be assigned to the Uto-Aztekan period. The Uto-Aztekan consonants will now be taken up in that order.

Uto-Aztekan p.

Initial Uto-Aztekan *p* ordinarily appears as N. *p*, Cora *h* (*x*) and *p*, Shoshonean *p*, Pap. *v* (before *a* and *i*) and *w* (before *o*, *u*, and *ŭ*).[1]

N. *poc-tli* "smoke, vapor, fog, mist," *popoca* "fumer, jeter de la fumée": S. P. *paγi-n'a-* "fog"; Cahu. *paxi-š* "fog"; Fern. *paki-t* "cloud"

N. *poçaua* "s'enfler," *poçati* "se gonfler de nourriture"; Cora *huša* "gesättigt sein, sich sättigen": S. P. *p'ʷ'tša-* "to be filled up"

N. *pia, pie* "garder quelqu'un; mettre en réserve"; Pap. *vih* "to stay, be left," *viah* "to leave something purposely": S. P. *piyai-* "to be left remaining"

N. *pellā-ni* "se verser, se répandre (en parlant d'un liquide)," frequentative *pepetla-ca:* S. P. *pára-γa-yĭ-n'i*ⁱ "rain is pattering"

N. *pauia* "mâcher" (transitive in *-a*, perhaps originally meaning "to cause to go down one's throat"): S. P. *paŋwi-* "throat" (< **pawi-*); A. C. *-pava* "throat"

N. *pani* "en haut, au sommet": S. P. *pa'ántʲ*ⁱ "high"

N. *paina* "courir vite"; Pap. *wōhpŭ* "to run (plur.)" (< **poi-kwĭ-* ?): S. P. *pōya* "to run about" (< **poi-na-* ?)

N. *pipina* "sucer des cannes à sucre," *pipinia* "s'imprégner d'humidité": S. P. *piyá-ɸ'* "sap, juice"

N. *pil-tli* "elder sister": S. P. *pia-* "mother, female;" S. J. C. *pĭ'-t* "younger sister"

[1] Dolores, *Papago Verb Stems*, p. 242.

N. *pil-li* "son, child"; Cora *péri, pári* "Sohn, Tochter, Kind, vom Vater gesagt": A. C. *pulyini-š* "baby" (*pulyi-* = *pulᵛi-*)

Cora *-poa* in *ki-pcá* "Haar"; Pap. *wohpoh* "hair on the skin" (< **poa-kwə-* ?): S. P. *pvā-* "hair, fur"; Fern. *puā-* "head"; Gabr. *pwa-* "head, hair"

Pap. *vah* "to go in" (< **paka*): S. P. *paγa-, paγai-* "to go, walk"

Pap. *vahʌɪ* "to rise from lying" (< **pamɨ*): S. P. *paŋwi-* (< **pamɨ-*) "(lying) on one's belly"

Pap. *vaɪ* "to call" (< **pai*): S. P. *pai-* "to call"

Cora *hure, -xure* "eine Kugel, einen Ball machen" (< **pole* ?): S. P. *pōɪˑᵘˑ-qwa-* "to be round"

Cora *híwe* "nach einem schreien, brüllen" (< **puwe*): S. P. *puŋˑwi-* "to make a peeping noise"

Cora *héika* "töten" (with singular object) (< **paika* ?): S. P. *paqˑa-* "to kill one"

Under as yet unknown conditions initial Uto-Aztekan *p* became *h* not only in Cora[1] but also in Nahuatl (and Huichol), where it then disappeared. Examples of N. zero, Cora *h-*: Pap. *v-*, *w-*: Shoshonean *p-* are:

N. *aca-tl* "roseau" (< **paka-*); Cora *haká* "das Schilfrohr"; Pap. *va-pˑah* "reed"[2] (doubtless reduplicated from **vah*): S. P. *paγa-mpv-* "reed"

N. *āch-tli* "frère aîné" (< **patsi-*); Cora *ha, has, hatsi(n)* "älterer Bruder"; perhaps also Huich. *matsi* "frère aîné": Cahu. *pas* "elder brother"; S. P. *pavi-* "elder brother," *patsi-* "elder sister"

N. *ix-tli* "face, visage, oeil" (< **usi-* < **pusi-*); Cora *hísi;* Huich. *utši, huži* (so I understand Diguet's *hougy*); Tar. *pusi-;* Cah. *pusi;* Pap. *wuɪ* S. P. *puˑɨ-ɸᵢ* "eye"; Tüb. *puntsi-* (why nasalized *-nts-*?); Cahu. *-pus*

N. *ò-tli* "path, road" (< **poi-* or **poe-*); Cora *huyé* "Weg"; Tepecano[3] *vɔi*, plur. *vɔpˑɔi;* Pap. *wōˑʞv̈* "road, trail," *wō-ˑkah* "to have a road" (*wō-* < **poi-*, cf. Pap. *wō-* < **poi-* in *wōhpv̈* above): S. P. *pō-* "trail"; Hopi *pɨ-hü;* Cahu. *pi-t*

Huich. *ya* "tobacco" (< **iha*, dissimilated from **hiha* < *pipa* ?); Cora *ya-na* "Tabak rauchen"; Tep. *viva* "tobacco"; Pap *vihwv̈* (> **pipɨ*): Hopi *piva* "tobacco;" Möh. *piva-t;* Luis. *piva-l.* Uto-Aztekan **pipa*

N. *ā-tl* "water"; Huich. *ha;* Cora *ha;* Cah. *ba:* S. P. *pāᵛ* "water"; Tüb. *pa-l;* Git. *bā-tc;* Gabr. *pa-r;* Cahu. *pa-l*

It is remarkable that in certain derivatives of Uto-Aztekan **pā-* "water" Nahuatl has preserved *p*, e.g. *pāli* "se fondre, se liquéfier,

[1] It is not clear to me when original *p* remains as such (or as *w* ?) in Cora and when it develops to *h*. Perhaps it regularly becomes *h* (*x*) before original *a, o* (Cora *i*), *ɔ* (Cora *u*), but remains *p* (or *w* ?) before original *i* and *e* (N. *e*, Pap.-Shoshonean *ɨ*).

[2] On Dr Mason's authority.

[3] Information obtained from Dr J. A. Mason.

se mettre en eau" (*-ti* "to become"). I can suggest no reason for this curious fact.

To judge from the one example available, this N. $h < p$ was shifted before *e* to *y*, which then remained (though variants without *y*- also occur, significantly enough):

N. *ye(i)*, *e(i)* "three" (< **hci* < **hai* < **pai*); Cora *wáɨ-ka* (perhaps changed from **pai-* by analogy of *wa-* "two"); Tar. *bai-ka;* Cah. *bahi;* Pima *vai-* (< **pai-*): S. P. *pai-* "three": Tüb. *pai;* Git. *bahi*

After vowels, Uto-Aztekan *p* appears in Southern Paiute as geminated *p̣*, spirantized *v*, or nasalized *mp*. Examples of geminated *p̣* are:

N. *pichauh-tica* "être engourdi, transi, mort de froid"; *pichaui-lizili, pichaquilizili,* "flétrissure, engourdissement": S. P. *t'ᵊ'-pit'ca-* "to crush by trampling" = *ta-p̣'it'ca-* (geminating *ta-* "by means of the feet")

N. *-pa, -ppa* "so and so many times," suffixed to numeral stems (e. g. *ce-ppa* "once," *o-ppa* "twice," *mallac-pa* "ten times"; has *-ppa* original geminated *pp*, or is *pp* developed from **cem-pa, om-pa* ?): S. P. *-p̣'a'ᵊ, -p̣''a-* "in (this, that) way"

Pap. *va'ĸv̈* "hole": S. P. *ᵓ'páq'ᵍ* "hole" = *ɔ-p̣'aq'ï-* (with geminating prefix *ɔ-*)

Cora *táxis, táxiɣ* "aufwachen" (< **ta-pus, *ta-pu*); Pap. *wuhhᴀ* "to awaken" (< **pus'a*): S. P. *t'ᵊ'pu-n'ni-* "to wake up" = *tup̣'u-n'ni-*

Cora *hɨpi* "sich niederlegen zum Schlafen" (< **hupi* ?): S.P. *ᵊ'pvi-* "to sleep" = *ap̣'vi-* (< **hap̣'ei-* or *hap̣'eni-* ?)

Examples of spirantized *v* are:

N. *paca* "to wash;" Tar. *pago-ta:* S. P. *na-vaq'i-* "to bathe oneself" (spirantizing *na-* is reflexive; *paq'ï-* does not occur without prefix in S. P.)

N. *uapal-li, uapali-tl* "planche, ais, petit poutre, bois"; Pap. *ovi'xšɪ* "awl": S. P. *ɔvi-* "wood"

N. *tlapcopa* "orient, levant" (< **tlapa-* or **tlapi-*, old stem for "sun"; *-copa* "de, par, vers"): Huich. *tau* "sun" (< **tawa* or *-i* < **tapa* or *-ï*); Cora *táɨ-ni* "sun" (antiquated): S. P. *tavva-* "sun"; Hopi *dawa;* Ban. *tavï*. Probably *-m-* of Git. *damia-t*, Gabr. *tami-t*, Cahu. *dami-t* is also developed from **pa* his intervocalic *-p-*

N. *tepitzin* "peu, petit" (*-tzin* probably diminutive): S. P. *tïvitsi-* "very"

N. *tepe-tl* "mountain"; Pap. *tšŭwŭhɪ* "dirt, earth, world": S. P. *tïvi-p̣'v-* "earth"; Hopi *dövа* (< **tepa*); Git. *dŭva-tc;* Cahu. *tema-l* (*-m-* as in *dami-t* above)

N. *-pa* local suffix of indefinite meaning (e. g. *cam-pa* "where, whither"; *ne-pa* "here, there"; *ipam-pa, pam-pa* "because"; *om-pa* "where"): possibly Cora *he-* (< **pa-* ?) in *hemi* "vor," *hete* "unter," *hetsán* "auf": S. P. *-vā-, -va-* "in, at"

N. *-pan* "upon;" Cora *ha-poa(n)* "auf, in, über": S. P. *-v'an'ᵃ, -va'an'ᵃ,*

N. *-cpac, -ti-cpac* "sur, au-dessus, en haut" (probably compounded of *-c, -cc* "in" and **-pac*): S. P. *-v'āγi-, -va'āγi-* "over" (< **-p'āki*)

Cora *tawi* "sich niederlegen" (sing. subj.) (< **ta-awi* < **-api* ? cf. *taɣ-* < **tɨwa-* "sun" < **tapa-* above): S. P. *avi-* "to lie" (sing. subj.)

Examples of S. P. words with nasalized *mp* corresponding to Nahuatl or Sonoran forms seem hard to find.

Uto-Aztekan t and tl

To Nahuatl *tl* regularly correspond in all Shoshonean and Sonoran dialects reflexes of Uto-Aztekan *t*; in other words, it is possible to keep apart Uto-Aztekan *t* from *tl* only in Nahuatl itself (in Pipil and Nahuatl dialects spoken in Oaxaca, however, *tl* has developed to *t*). I possible to formulate some law accounting for N. *tl* as developed from original *t* according to certain phonetic circumstances, we could dispense with a Uto-Aztekan *tl*. As this cannot be done, it seems necessary to assume Uto-Aztekan *tl* as well as *t*. It may be that more complete and carefully sifted evidence than can now be presented will later show that the reflexes of Uto-Aztekan *t* and *tl* are not always identical even outside of Nahuatl itself.

Examples of Uto-Aztekan *t*: S. P. (Shoshonean) *t* initially are:

N. *toquia* "attiser le feu"; Pap. *tšuh* "fire goes out" (Pap. has regularly *tš* before *u, ü*, and *ɨ*, but *t* before *a* and *o*)[1]: S. P. *tuγwa-* "to put out the fire," *tuγwi-* "fire goes out"

N. *tequi* "couper": S. P. *tīγa-n'ni-* "to butcher (meat)"

N. *te-tl* "stone"; Cora *tetɛ́:* S. P. *tī-* "stone"; Fern. *to-ta*

N. *tepe-tl* "mountain"; Pap. *tcūwūhᵽ* "earth": S. P. *tīvi-* "earth"; Cahu. *tema-l*

N. *topeua* "pousser, arracher une chose"; Pap. *tšüvaiʌ* "to drag": S. P. *tīva-* "to come loose." Uto-Aztekan **tope-, tepa-*

N. *ti¸a-tl* "sorte de vernis, terre ou poudre blanche"; Pima *tāhai* "white"; Huich. *tousa* "blanc"; Cah. *tosa-li:* S. P. *tɔš'a-* "white"

N. *ten-tli* "lips, mouth"; Cora *téni:* S. P. *tīmpa-* "mouth"; Fern. *-tō̄ŋi-*

N. *toch-tli, tochin* "lapin": Luis. *doɔi-xi-t* "rabbit"; Gabr. *tošo-xo-t*

N. *tema* "remplir une chose de semence ou de terre": S. P. *tīŋwa-* "to cover up, close up (hole)"

N. *tèhuān* "we," *tech* "us"; Tar. *tame:* S. P. *taŋwa-* "we (inclusive)," *tam'i-* "we two (inclusive)"; Hopi *ī-tamō*

[1] Dolores' *ü* is identical with our S. P. *ɨ*, both corresponding to Nahuatl *e*.

N. *teci* "moudre le mais sous la pierre"; Pap. *tšuɪ:* S. P. *tˢʷˈǰu-* "to grind seeds"
N. *te-, tequi-* "beaucoup, extrêmement": S. P. *tī-* "much, greatly"
N. *teneua* (refl.) "se nommer, être appelé," *teneui* "devenir illustre": S. J. C. *-tᵘuŋ* "name"; Fern. *-tuano-* "name"

Examples of Uto-Aztekan *tl*: S. P. (Shoshonean) *t* initially are:

N. *tlāca-tl* "person"; Cora *tá'ta* "Mann": Hopi *tȧqa* "man"; A. C. *-tax'a* "person"
N. *tla* in *tlanēci* "to dawn," *tlathui* "to dawn, become light": S. P. geminating *ta-* in *tˢʷˈ-ǰɪa-* "to dawn"
N. *tlap-copa* "orient, levant"; Cora *tay-ni* "sun": S. P. *tava-* "sun"; Hopi *dawa;* Tüb. *da-l;* Gabr. *tami-t*
N. *tlèco* "monter"; Pap. *tšühš* "to go up, climb, ride": S. P. *tī'* "up," *tuγu-mpa-* "sky"
N. *tlan-tli* "tooth"; Cora *tame:* S. P. *taŋwa-* "tooth"; Hopi *tama;* Tüb. *dama-;* Fern. *-tama*
N. *tlan-quaitl* "knee"; Cora *tunú;* Pap. *tohɴÜ:* S. P. *taŋa-* "knee"; Hopi *dami;* Tüb. *toŋo-;* Git. *-tama*

Examples of Sonoran *t-*: Shoshonean *t-* are:

Huich. *tope, topi* "arc": Luis. *kutapi-š* "bow"; A. C. *gutapi-š*; S. J. C. *-qutup*
Cora *tíka-ntše* "in der Tiefe"; perhaps also Pap. *tšuhpɪ* "to sink": S. P. *tˢʷˈqwa-* "to be deep"
Cora *tevi* "der Mensch, die Person" (< **tewi*), plur. *táite;* Pima *tiwo-t;* Pap. *tšüo-tšɪ* "man, male": S. P. *taŋ'wa-* "man" (< **ta'wa-*); Tüb. *datwa-l* (misheard for *ta'wa-l* ?). Uto-Aztekan **tewa* or **tlewa;* Shoshonean **ta'wa-* assimilated from **tī'wa-* ?
Huich. *touhou* (i. e. *tuhu*) "braise": Ser. (H.) *tuu-tᵛ* "coal"; Fern. *dūu-t;* Luis. *du-la;* Tüb. *duldul.* S. P. *tō-q'a-* "to be black" may be derived, with suffixed adjectival *-q'a-*, from this stem; "black" < "coal-colored"
Huich. *tagui, tahoui* (i. e. *tawi*) "poitrine"; Cora *tabi:* Cahu. *-tau, -tawh* (i. e. *-taW*) "breast"
Cora *téne* "in Stucke schlagen": S. P. *tɔn'a-* "to punch"
Cora *tíka* "Nacht sein"; Pima *tšoka-ŋgi* "night": S. P. *tuγwa-* "to be night"; Wob. *toxa-wan* "night"; Tüb. *duga-l;* Luis. *duku-mi-t*
Pap. *tšühhu'xÜ* "meat" (< **tuk'u-*?): S. P. *tˢʷˈqua-* "meat"
Pap. *tahŋ* "foot," *ta'tü-wuah* "to put the foot in something": S. P. *ta-* "with the foot"
Pap. *tšu'ihrtšɪ* "to ask a question" (< **tw'i-* < **tīvi-* ?): S. P. *tīvi-* "to ask"
Pap. *tšüh* "to taste": S. P. *tˢʷˈqa-* = *tīq'a-* "to eat"
Pap. *tšüɪ* "to say": S. P. *tīn'ia-* "to tell"

In these, owing to lack of Nahuatl evidence, we cannot at present tell in which cases we are dealing with Uto-Aztekan *t-* or *tl-*.

After vowels, Uto-Aztekan *t* and *tl* appear in Southern Paiute as geminated *t'*, spirantized *r*, or nasalized *nt*. Examples of N. *-t-* corresponding to all three of these forms are:

N. *-ton-tli* "suffixe marquant la petitesse": S. P. *tua-* "child, son"; as diminutive suffix *-t'ua-*, *-rua-*, *-ntua-* "small, young of." Uto-Azetkan **tona-*

N. *-ti-* "particule servant à unir les verbes avec les verbes irréguliers," *-ti-c* adjectival suffix: S. P. *-t'ĭ*, *-rĭ-*, *-ntĭ-* suffix of present participle. It is quite doubtful, however, if these elements are really cognate

N. *-ti* "to become": S. P. *-t'ui-*, *-r'ui-*, *-nt'ui-* "to become, turn into"

N. *-tech* "dans, sur, à, de, près": S. P. *-t'uγwa-*, *-ruγwa-*, *-ntuγwa-* "to" (probably compounded of two postpositive elements **-tu* and **-γa-*)

Similar in form to these, but corresponding, it would seem, to N. *-tl-*, is:

N. *-tloc* "with, near to"; Huich. *-touha* (i. e. *-tuha*) "au bas" (cf. adverbs *ha-toua-na*, *ha-tou* "dessous," *rhe-touha* "en bas, sous"): S. P. *-t'uq'wa-*, *-ruq'wa-*, *-ntuq'wa-* "under"

Whether Uto-Aztekan *-t-* or *-tl-* is to be assumed is uncertain in:

Pap. *-ʀšv* "to make, to make for": S. P. *-t'u-*, *-ru-*, *-ntu-* "to make"

Examples of S. P. geminated *-t'-* corresponding to N. *-t-*, *-tl-* are:

N. *-tia* causative suffix; Cora *-te* causative: S. P. *-t'ui-*, *-t'ĭi-* causative

N. *-tla* "qui sert á marquer abondance, quantité" (e. g. *te-tla* "lieu pierreux"); Cora *-ta* (e. g. *sā-ta* "sandiger Ort"): S. P. *-t'ĭa-* "place of"

Examples of S. P. spirantized *-r-* corresponding to N. *-t-*, *-tl-* are:

N. *cat-qui* "to be (in a place)," *catê* (present plural): S. P. *qarĭ-* "to sit, dwell"; Hopi *gatö* "to sit"

N. *coto-na* "couper, mettre en morceaux quelque chose, cueillir des fruits": S. P. *ts'-qur'u-* "to tamp (tube) by pushing (stick) back and forth"

N. *metla-tl* "metate"; Huich. *mata;* Pap. *mah'tšuhʀ* "grinding stone, metate": S. P. *mara-*; Luis. *mala-* (*-l-* < *-t-*)

N. *petlā-ni* "se verser, se répandre (en parlant d'un liquide)": S. P. *pāra-xa-* "rain patters"

N. *quetl* (poetic form of *quetza*) "to arise from": S. P. *qwĭrĭ-* "to get up"

Before and after *i* Shoshonean *-t-* (whether from Uto-Aztekan *-t-* or *-tl-*) becomes S. P. *-tš-*, *-ts-*. Thus, after *i*, present participial *-tĭ-* appears as *-tšĭ-*, *-ntšĭ-*; *-tuγwa-* "to" as *-tšuγwa-*, *-ntšuγwa-*; *-tu-* "to make" as *-tšu-*, *-ntšu-*. Further examples are:

N. *iste-tl* "nail"; Cah. *sutu;* Pap. *hurši* (< **suti*): S. P. *šitšu-* "nail, claw" (< **situ-*); Tüb. *šulu-* (< **sutu-*)

N. *cuitla-tl* "excrement"; Cora *tšuita* "Exkremente von Menschen und Tieren"; Pap. *pihr* "manure" (< **kwita-*): S. P. *qwitša-* "to defecate"

N. *-tl, -tli* noun ending: S. P. *-tsi-* noun ending; Cahu. *-t, -l, -š* (after *i*, e. g. *ki-š* "house," *yuŋawi-š* "buzzard," *qawi-š* "rock;" this *-š* goes back to *-tš*, as shown by comparison with Luiseño); Luis. *-tša* (after *i*), *-la* (both from **-ta* < **-tla*, form parallel to **-tli*); Tüb. *-l*

Pap. *kũtšah* "semen," *kũtši-wuah* "to emit seed" (< **kĩti-*): S. P. *qĩt'si-* "saliva" (< **kĩt'i-*)

It is not quite clear whether S. P. *tš* has developed from *tl* > *t* before original *i* or *ĩ* in:

N. *atla-tl* "spear-thrower": Hopi *auta* "bow"; S. P. *'atši-;* Kawaiisu[1] *etũ;* Bank. *ãti-t*

N. *tl* and S. P. *tš* may possibly also correspond in:

N. *tle* "que? quelle chose?" *a-tle* "rien" (literally "not-what"): S. P. *-tšu-* in *qa-tšu-* "not" (extended form of negative *qa-*); Ute *qa-tši-* (= Uto-Aztekan **ka-tle-*); Mono (N. F.) *ga-du-*

N. *uitlallõ-tl* "espèce d'oiseau tres-allongé, volant peu mais courant extrêmement vite": S. P. *wvt'ša-* "roadrunner"

Nahuatl *t*, originally followed by now elided *i*, has become *tš* (*ch*) in:

N. *oquich-tli* "homme, mari mâle": Cahu. *qeat, kiat* "boy"; Fern. *koti* "young man"

N. *quech-tli* "neck" (< Uto-Aztekan **keti-*): A. C. *-qelyi* "neck"; S. P. *qura-*. N. *quech-* may, however, go back to Uto-Aztekan **ketše-* (assimilated from **kotše-* ?), cf. Pap. *kuhšũwoh* "neck" (< Uto-Aztekan **kotše-*) and Tepecano *kušuá* "neck"[2] (< Uto-Aztekan **kotšo-* assimilated from **kotše-*), which forms are in turn perhaps to be compared with Cahu. *quspi* "throat" (see under Uto-Aztekan *k:* Cora *kipi*)

Uto-Aztekan tš, ts

While S. P. *tš* not infrequently, as we have seen, goes back to Shoshonean *t*, whether in turn developed from Uto-Aztekan *t* or *tl*, and N. *tš* (*ch*) also in certain cases is developed from *t*, there remains another series of examples in which N. *ch*, *tz* correspond to S. P. (Shoshonean) *tš*, *ts*. These justify us in assuming an original Uto-Aztekan *tš* (*ts*). N. *ch* and *tz* both occur freely, and I can give no rule that would clearly indicate that they are variants of one prototype (compare, however, *mi-tz* "thee" with *te-ch* "us"). It may be that we should assume two distinct affricative sibilants, *tš* and

[1] Californian dialect of Ute-Chemehuevi group.

[2] On Dr Mason's authority.

ts, for Uto-Aztekan, though I should be inclined at present to doubt whether this would be correct. In Southern Paiute *tš* and *ts* vary primarily according to mechanical phonetic rules, *ts* always standing instead of *tš* before *i*. Similarly, in Papago *š* represents original *tš* before *a*, *o*, and *u*, while it is replaced by *s* before *i* and *ü* (examples of Pap. *š* corresponding to N. *tz*, *ch* are: N. *chocoa* "to cry": Pap. *šohšah*; N. *metztli* "moon": Pap. *mahša'ᴛ*).[1]

Examples of Nahuatl *ch* corresponding to Shoshonean *ts* are:

N. *chichi* "dog" (assimilated from **kutši*); Tar. *koktši;* Cora *kítsi* "das Haustier": Git. *gutsi* "dog"; Möh. *gutši;* Ser. (H.) *kwutši*

N. *pichauh-tica* "être engourdi, transi, mort de froid," *pichaui-lizli* = *pichaquilizlli* "flétrissure, engourdissement": S. P. *tᵘᵊ'-pit'ša-* "to crush by trampling" (*ta-* "by trampling")

Examples of Nahuatl *tz* (Pap. *š*) corresponding to Shoshonean *tš*, *ts* are:

N. *-tza* frequentative transitive suffix with verbs expressing sounds and various activities (e. g. *cocomo-tza* "hazer estruendo con los pies" from *comō-ni* "hazer ruido alguna cosa pesada que cae"; *popolo-tza* "hablar a otro en lengua barbara" from *polō-ni* "hablar barbaramente")[2]: S. P. *-tša-* frequentative transitive suffix (e. g. *tsʻ-kᵘavi-tša-* "to cut several things," *tšᵘᵊ'-qoi-tšu-* "to take off several articles of clothing")

N. *tzon-tli* "hair;" Cah. *tšoni:* Mono (In.) *tsobip* "hair"; Tüb. *tsom'o-;* S. P. *tšɔ-* (Ute *tšu-*) "with the head," *tsɪ'si-* "head" (perhaps dissimilated from **tsɔɪ'si-*)

N. *-tzin* (vocative *-tze;* plural *-tzitzin*) suffix indicating reverence, respect, endearment, originally doubtless diminutive, as in *uitzi-tzi-lin* "oiseau-mouche" (from *uitzi-lin;* see below); Cora *-tsi(n)* diminutive suffix (as in *hátsi, hátsin* "older brother"; *hűtsi* "younger brother"): S. P. *-tsi-* diminutive suffix (not to be confused with noun-ending *-tsi-:* N. *-tli*); Gabr. *-tši* (as in *mutu-tši* "flea")

N. *uitzilin* "petit oiseau qui bourdonne," *uitzil-aztatl* "bird-heron," *uitzi-tzi-lin* "oiseau-mouche": S. P. *witsi-tsʻ* "bird"; Ser. (H.) *witši-t*

Pap. *sīhš* "elbow," *SihŠū-wuah* "to hit with the elbow" (< Uto-Aztekan **tsitse-*): S. P. *man-tsɨ́ʊ-ɸⁱ, man-tsɨ́-'aᵗ* "bone from elbow to wrist" (*man-* "hand")

Nahuatl *tš*, *ts* corresponds to Shoshonean *š*, *s* in:

N. *toch-tli, tochin* "lapin": Luis. *dosi-xi-t* "rabbit"; A. C. *disi-xa-t;* S. J. C. *dòš-t;* Gabr. *tošo-xo-t;* Fern. *toho-x-t* (*-h-* < *s*); Git. *dühò-gu-t* (*-h-* < *s*)

N. *ach-tli* "frère aîné;" Cora *has* "alterer Bruder": Cahu. *pas* "elder brother"

[1] Dolores, *Papago Verb Stems*, p. 242.

[2] See Carochi, pp. 476–478.

N. *uetzi* "to fall"; Tepecano *gīš*, preterit *gīi* (*gīš* < **wītsi*) "to fall into the water";[1] S. P. *wī'ī-* "to fall" (< **wīsī-*)

Tepecano *šia-* (< Uto-Aztekan **tšia-*) in *tá-šia* "morning," *a-šiá-t* "to dawn," *šī'ā-r* "east"[1]: S. P. *-šia-* in *ta-š'ta-* "to dawn" (for *ta-* see N. *tla-* under Uto-Aztekan *tl*)

Possibly also in:

N. *quech-tli* "neck": Cahu. *qus-pi* "throat" (see N. *quech-tli* under Uto-Aztekan *t*)

Uto-Aztekan k

Uto-Aztekan *k* regularly appears as Nahuatl *k* (written *c* or *qu*) and as Shoshonean *k*. In Southern Paiute this *k* is always more velar (*q*) than mid-palatal before all vowels but *i*, in which case it appears as *k*; after *i* it is regularly palatalized to *kʸ*. Examples of initial Uto-Aztekan *k* are:

N. *quech-tli* "neck": S. P. *qura-* "neck" (but see N. *quech-tli* under Uto-Aztekan *t*)

N. *que-* verbal prefix referring to "teeth" (e. g. *que-tzoma* "mordre," cf. *tzoma* "coudre, couvrir une chose de paille"): S. P. *qī-* instrumental prefix "with the teeth." Related to this is perhaps

Pap. *kūI* "to bite, sting"; Cora *kì* "fressen (von fester Nahrung)": S. P. *qī'ī-* "to bite"

N. *cā, cat-qui* "to be in a place"; Cora *ka* "sein, sich befinden, sitzen" (sing.): S. P. *qarī-* "to dwell, sit" (sing.); Hopi *gatō* "to sit"

N. *cal-li* "house"; Tar. *kali-:* S. P. *qan'i-* "house"

N. *-camo* "not"; Cora *ka* "nicht, nein": S. P. *qa-, qatšu-* "not"

N. *can-tli* "cheek"; Pap. *kaM:* Tüb. *gaŋa-* "beard"

N. *cochi* "to sleep"; Cora *kutsu* "schlafen, einschlafen," *kutsi-te* "einen einschläfern"; Pap. *koI* "to sleep (sing.), die (plur.)"; Tepecano *koš*, preterit *koi:* S. P. *qɔ'ɔi-* "to go to sleep (plur.)"

N. *icxi-tl* "foot" (with prothetic *i-*, cf. *no-cxi* "my foot"; < **kesi-, kasi-* ?); Tepecano *kāi* "foot"[1] (< **kaŋi* < **kasi*): Mono (In.) *-gūgūi* "foot" (reduplicated); Hopi *gŏxgō*

N. *col-li* "aieul, aieule": S. P. *qun'u* "great-grandfather"; Ute *qōn'u-* "paternal grandfather"

Cora *kin* "der Gatte"; Pap. *kuN* "husband": S. P. *qum'a-* "husband, male"

Cora *kipi* "Hals" (< **kupi;* Diguet gives *koujpi* "cou"); Huich. *kouipi:* Cahu. *quspi* "throat." See also Pap. *kuhŠūwoh* and Tepecano *kucuá* under Uto-Aztekan *t* (N. *quech-tli*)

[1] Quoted on Dr Mason's authority.

Huich. *ki* "house"; Cora *tšï* "Hütte" (< **ki;* Uto-Aztekan *ki-* regularly gives Cora *tšï-*, while Cora *ki-* goes back to Uto-Aztekan *ko-*); Pima *ki:* Hopi *ki-hŏ* "house"; Cahu. *ki-š*

After vowels, Uto-Aztekan *k* appears in Southern Paiute as geminated *q̇*, spirantized γ, or nasalized *ŋq*. Examples of N. *-k-* corresponding to all three of these forms are:

N. *-qui* (present imperative), *-quiuh* (future indicative), *-co* (present and perfect indicative) "to come to do so and so": S. P. *-k̇i-*, *-γi-*, *-ŋki-* "to come to do so and so"

N. *-que-il(i)* (older form), *-c* "having"; Cora- *ke* (e. g. *péri-ke* "ein Kind haben"); Pap. *-'kah* "to have or claim": S. P. *-q̇ai-*, *-γai-*, *-ŋqui-* "to have"

N. *-c* adjectival suffix (e. g. *izta-c* "white" from *izta-ll* "salt"): S. P. *-q̇a-*, *-γa-*, *-ŋqa-* adjectival suffix; Cahu. *-xa-* (spirantized form of suffix: *seta-xa-t* "salty")

N. *-ca* "avec, par, à l'aide de, au moyen" (this suffix often makes gerunds or adverbs out of verb stems: *ɨciuh-cā* "quickly" from *ɨciui* "to go quickly, hurry," e. g. *ɨciuhcā n-iauh* "while-hurrying I-go"): S. P. *-q̇ai-*, *-γai-*, *-ŋqai-* "as, when" (verbal suffix making subordinate clause whose subject is identical with that of main clause; followed by *possessive* pronominal suffixes)

N. *-co*, *-c* "in, from": S. P. *-q̇o-*, *-γo-*, *-ŋqo-* "as, when" (verbal suffix making subordinate clause whose subject is different from that of main clause; followed by *possessive* pronominal suffixes)

N. *-quia* suffix used in apodosis of conditional sentence: S. P. *-q̇ō-*, *-γō-*, *-ŋqō-* irrealis

Examples of geminated *-q̇-* in Southern Paiute are:

N. *paca* "laver une chose"; Tep. *baku-ane:* S. P. *na-vaq̇ï-* "to bathe" (intransitive)

N. *noquia* "verser," *noqui-ui* "couler, se répandre (en parlant d'un liquide)": S. P. *ᴺᵃ'qwí-ul'ᵍᵎ = nuq̇'wi-* "stream" (*-qw-* < *-q-* because of preceding *u*)

N. *miqui* "to die"; Huich. *mouki* "mort"; Cora *muitši* "tot" (< **muikï*); Pima *muha* "to die," *moki* "dead"; Pap. *muh* "to die" (< **muka*, cf. Pima *muha*): Hopi *moki* "dead"; Cahu. *muki-š* "dead," *meka* "to kill"; S. P. *tša-ŋwvk̇'i-* "to die off" (< **-mīk̇'i-*)

N. *-que* plural suffix in perfect and future, also for certain nouns (e. g. *ueuelquê* "old men," regularly of possessive nouns in *-ê*, *-uâ*), *-can* plural suffix in imperative and present optative: S. P. *-q̇'a-* verbal suffix indicating plurality of subject

N. *-c-*, *qui-* "him, her, it": S. P. *-a-q̇'a-* "it (visible)," *-'...q̇'wa-* (invisible)" (these pronominal suffixes are compounded of *-q̇'a-* "it," which does not appear as such, and demonstrative stems *a-* "that visible" and *'u-* "that invisible")

N. *-c, -qui* (older form) preterit suffix, *-qui* past participle (e. g. *palan-qui* "corrompu") *-ca* pluperfect suffix (preterit suffix of certain irregular verbs, e. g. *cat-* "to be somewhere"); Huich. *-kai* preterit suffix (e. g. *moumouk'i-kaī*, "il était mort"): S. P. *-q'ai-n'a* makes perfective verbal nouns, *-q'a-ntī-* makes perfective participles

Cora *tĺka-ntše* "in der Tiefe": S. P. *t'ᵘ'qwa-* = *tuq'a-* "to be deep"

Pap. *va'xv̈* "hole": S. P. *ᵛ'-páq'ᵘ* "hole"

Pap. *noh* "to bend" (< **nɔkɔ-*): S. P. *nᵊ'qɔm'i-* "to bend" = *nɔq'ɔ-*

Pap. *tšüh* "to taste" (< **tūka-*): S. P. *t'ᵘ'qa-* = *tīq'a-* "to eat"

Other examples than S. P. of Shoshonean postvocalic *k* are:

Huich. *houca* (i. e. *huka*) "jambes"; Cora *houca* (quoted from Diguet; Preuss gives *ĺka* "der Fuss, das Bein, der Knochen"); Cah. *huoki:* Hopi *hokya* "leg"; Mono (N. F.) *-huk*

N. *miec* "much": Luis. *muyuk* "much." This *-k* is suffixed, as shown by Cora *mui;* Pima *moi* "many"

N. *èca-tl* "vent, air"; Cora *äka(ri)* "Wind"; Huich. *heheaca* "air" (reduplicated): Tüb. *üxka-wa-l* "wind"; Mono (N. F.) *hig-wa-p;* Gabr. *ahika-ŋ*

Examples of S. P. spirantized *γ* are:

N. *yecoa* "avoir des raports charnels avec quelqu'un"; S. P. *yoγo-* "to copulate"

N. *yaca-tl* "nez, pointe"; Cah. *yeka* "nose": Hopi *yaka* "nose"; S. P. *yaγā-* "end"

N. *toquia* "attiser le feu": S. P. *tuγwa-* "to put out the fire" (*-w-* due to *u* preceding *γ*)

N. *tequi* "couper," *ui-tequi* "égrener en frappant": S. P. *tīγa-n'ni-* "to butcher (meat)," *tīγa-* "to gather seeds by beating with seed-beater"

N. *-ca* frequentative intransitive suffix of verbs expressing sounds and other activities (e. g. *calā-ni* "hazer ruido cosas como nueces, el cacao quando le cuentan": *cacala-ca* "se usa quando estas cosas son muchas"; *pallā-ni* "volar": *papalla-ca* "reboletear el ave, temblar el corazon")[1]: S. P. *-γa-, -xa-* frequentative intransitive suffix, particularly of verbs expressing sounds (e. g. *qī-k'i-n'ia-* "to sound like one tear of a rag": *qī-xa-n'ia-* "to sound like a rag tearing;" *'ᵘ'puq'wi-* = *up'uq'wi-* "to bounce": *ovoq'wa-γa-* "to bounce up and down like a rubber ball")

Huich. *queatzou* "poisson" (i. e. *kea-tsu*): S. P. *pā-γĭu-* "fish" (lit. "water-fish"); Cahu. *kiyu-l* "fish"

N. *poc-tli* "smoke, vapor, fog, mist": S. P. *paγi-n'a-* "fog"; Cahu. *paxi-š* "fog"; Fern. *paki-t* "cloud"

N. *oco-tl* "pinus tenuifolia"; Cora *hukú* "Kiefer": S. P. *oγó-mp'ᵘ* "fir"

[1] See Carochi, pp. 476–478.

N. *maca* "to give"; Cah. *maka;* Pap. *mah* (< **maka*): S. P. *maγa-* "to give;" Fern. *maxa;* Cahu. *maxa;* Git. *a-mak*

N. *çoqui-tl* "boue, fange": S. P. *soγo-* "moist ground"

N. *coa-tl* "serpent"; Huich. *kou* (i. e. *ku*): S. P. *-γoa-* in *to-γóa-φ*^{i} "rattlesnake"

N. *aqui* "qui?" *acá* "quelqu'un": Cahu. *haxi* "who?" Fern. *haki* "who?" Hopi *hak'i* "who": S. P. *aγa-* "where? how? what?"

N. *acatl* "roseau"; Cora *haká* "das Schilfrohr": S. P. *paγa-* "reed"

Cora *tíka* "Nacht sein"; Pima *tšuka-ŋgi* "night": S. P. *tuγwa-* "to be dark, night" (*-w-* due to *u* preceding *γ*); Tüb. *duga-l*

Pap. *vah* "to go in" (< **paka-*): S. P. *paγa(i)-* "to walk"

N. *-cpac* "sur, au-dessus, en haut": S. P. *-v'äγi-* "over" (< **-p'äk'i*)

Several of these examples show that Shoshonean *-k-* is often spirantized to *-x-* in Luiseño-Cahuilla and Gabrielino-Fernandino. Further such examples are:

N. *tlâca-tl* "person": Hopi *tdqa* "man"; Git. *daga-t* "person"; Fern. *daxa-t;* Luis. *-tax;* A. C. *-tax'a*

N. *çaca-tl* "paille, herbe, jonc": Ser. (H.) *haka-t* "willow"; Cahu. *saxa-t*

N. *aca-na* "mettre à sec, tirer une chose de l'eau," (refl.) "se mettre à sec, en parlant d'un navire": A. C. *haxa-l* "sand"; Luis. *ex'-la* "earth"; Gabr. *öxa-r* "land"; Fern. *ôxa-r* "land"

An example of S. P. nasalized *ŋq* corresponding to N. *k* is:

N. *nacaz-tli* "ear"; Huich. *naka;* Cah. *naka;* Pap. *nahxü:* Hopi *nak*^{u}*-ve* "ear"; Mono (N. F.) *-nakx;* Luis. *-nag;* Cahu. *-naq'a;* S. P. *naŋqá-va-φ*^{i} "ear," *naŋqa-q'ai-* "to hear." We saw above, however, that S. P. *-ŋŋ-* may here go back to reduplicated **nanaka-;* cf. Tep. *nanaca* (according to Diguet), Pima *nank* (quoted from Kroeber; Russell gives *nahaka*), Fern. *-nanak.* We are doubtless dealing with Shoshonean *-ŋk-* also in Shik. *-naŋi* "ear" (misheard for *-naŋgi* ?); Tüb. *naŋha-* (< **naŋxa-* < **naŋka-;* cf. Tüb. *aŋhanï-l* "person" < **aŋxanï-* < **aŋkanï-* < **a-nakanï-:* A. C. *naγani-š* "man" < **nakani-*)

N. *k* seems to correspond to S. P. *kw* in:

N. *quetl* (poetic form) "to arise," *quetza* (ordinary form): S. P. *qwïrï-* "to get up"

GEOLOGICAL SURVEY OF CANADA
OTTAWA, ONTARIO

(Part II to be Concluded)

A STRATIFICATION OF CULTURES IN EASTERN NEBRASKA

By FRED H. STERNS

A MARKED difference in the character of archeology as treated by the scientists of Europe and those of America has often been noted. The former studied relations of time and the latter relations of space. One considered cultural sequences and the other culture areas. To the European archeologist, peoples of one physical type and one kind of culture were succeeded by another people with different physical and cultural characteristics, and these in their turn were replaced by still other tribes or races. In America, on the other hand, the tendency has been to see all cultures as more or less contemporaneous except so far as the distinction has been made between the historic and the prehistoric. Some American archeologists, however, have believed for a long time that there would be revealed sequences of types on this continent which would correspond in some degree with those in Europe. The proof of such sequences must be grounded on stratigraphic evidence, and stratified sites have been very rare. Hence such a site has a high scarcity value and warrants special study even though it be otherwise of minor importance. Such considerations are the excuse for the present paper on a stratified site in the Missouri valley.

The Walker Gilmore site was named from the boy who gave the information which led to its discovery. His father is a prominent physician in Cass county, Nebraska, and takes considerable interest in local archeology. The boy, following his father's footsteps, found pottery in a gully near the Missouri river. While I was making archeological researches in this county for the Peabody Museum of Harvard University, he informed me of his find and I began investigations in that vicinity at once. Both father and son rendered valued assistance during these researches, and I wish to take this occasion to thank them publicly.

The gully in which the pottery was discovered is situated on the N.E. ¼ of the N.E. ¼, Section 28, Township 11, Range 14, in eastern Cass county, Nebraska, on the farm of Mark White, whose father was the first settler on the place. It is about six miles southeast of Murray, eight miles south of Plattsmouth, and a mile and a half south of the former river town of Rock Bluff. In this vicinity considerable archeological work has been done in the last two seasons. A University of Nebraska party, under the direction of Mr Robert F. Gilder of Omaha, discovered about sixty skulls within the Plattsmouth city limits. Dr G. H. Gilmore of Murray excavated one earth-lodge site near Rock Bluff and collected surface material from several other places in the county. Our party worked in the vicinity for about five weeks last year and a similar time this year. Four miles south of the farm of Mark White we excavated two of the semi-subterranean rectangular earth-lodge sites such as I described in a recent number of this journal.[1] These sites furnished a great abundance of potsherds, and many flint and bone implements. Several more of these sites are known to exist within two miles of the White farm.

The gully in which the finds were made forms the upper portion of the course of an intermittent stream. The lower portion of this stream's course is through an alluvial terrace of the Missouri river. This terrace is now about a quarter of a mile wide and sufficiently raised above the present level of the river to be out of reach of even the highest water. It is separated from the flat through which the gully runs by an old river bank about eight feet high. This flat forms an east-and-west gap between two high river bluffs to the north and to the south of it. Its greatest width from slope to slope is about a quarter of a mile.

The stream formerly had a winding southeasterly course across the alluvial terrace; but the owners of the property diverted the creek a few years ago by digging a drainage ditch almost due eastward. The great shortening of its course thus produced has caused it to cut the gully which it now occupies. This gully averages about 30 feet in width and 20 feet in depth, and has almost vertical walls.

[1] *American Anthropologist*, XVI, 135–7.

1. LOOKING EAST TOWARD THE WALKER GILMORE SITE. THE LIGHT-COLORED FIELD WHERE THE FARM IMPLEMENT STANDS IS THE PLACE WHERE THE RECTANGULAR HOUSE SITE POTTERY WAS FOUND. THE TREES NEAR IT ARE ON THE BANKS OF THE GULLY IN WHICH THE ASH-BEDS ARE FOUND

2. A POCKET OF DUMPED ASHES OCCURS IN THE CENTER OF THE DARK BAND OF CREEK MUCK. TO THE LEFT IS A LAYER OF CREEK GRAVEL CONTAINING SOME CHARCOAL

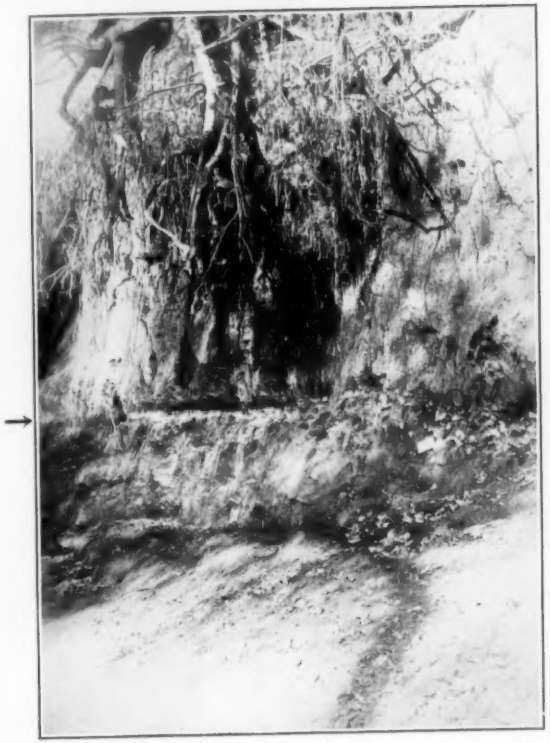
In places its sides and bed are composed of a yellow loess-like clay similar to that which forms the neighboring river bluffs, while in other places it cuts through deposits of blue "gumbo" clay, such as is common in the creek beds of the region, or through creek gravels, or through secondary loess such as could occur only as wash from the hills. The distribution of these various materials in the gully and for some distance in its banks (as determined by boring with a long auger) makes it clear that the present stream is cutting across the course of an older stream whose channel was wider than that of the present creek. The banks of the older stream valley had a much gentler slope than those of the present gully, and its course was not the same as that of the present stream. Where the latter cuts the old channel, the gully walls consist of "gumbo" clay, gravel, or secondary loess. Where it does not cut the old valley, the walls are the original yellow clay.

These deposits of the old stream and the material which has washed from the hills and buried them contain traces of human occupancy at various levels. In the first place, on the flats around the gully there are many fragments of pottery and a few flint implements. This pottery is of a brownish or grayish color with no surface luster. It is commonly of the form of a pot of medium size. About ten percent of the rim fragments show signs of the presence of lugs. A marked characteristic of this pottery is the almost constant presence of a sharp angle where the body of the pot meets the vertical or reflex rim. About half this pottery is without decoration, while the decoration of the remainder consists mainly of thumb impressions on the rim, varied now and then by the impressions of some sharp implement. This is the typical pottery of the rectangular earth lodges. None of these lodges was actually found on this flat; indeed one could not expect to find them, as the field has been plowed since 1857 and all traces of them would have been destroyed in that length of time. It is important, however, to know in a general way the position these lodges originally occupied. Were they on the flats which cover the bed of the old stream where the pottery fragments are now found, or was they on the hills and has the pottery been washed to its present position on the flats?

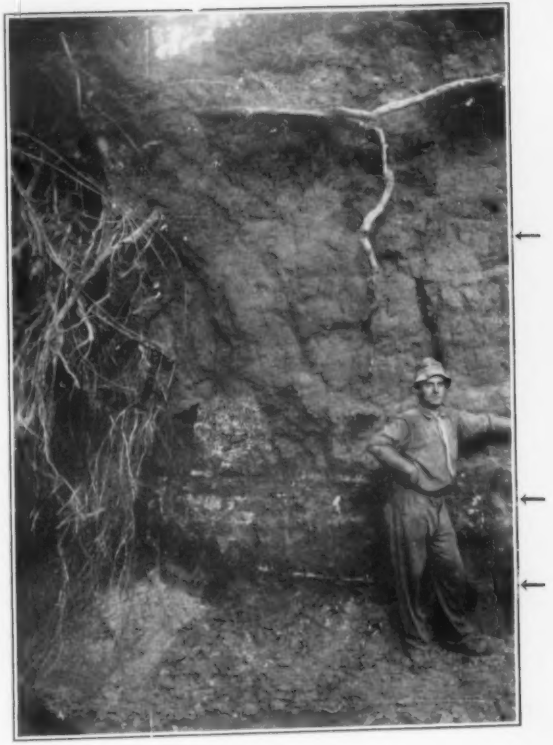
The following considerations make me feel certain that the lodges stood where the pottery is now found rather than that the latter has been washed from the hills. Portions of the hilltop have only recently been cleared, and when I was there they were newly plowed. All lodge sites which had ever existed there should still be discernible; and if any pottery was there to be found, the conditions for its discovery were the most favorable. But we could neither locate an earth lodge nor find the smallest potsherd. On the slope of the hill, at two different heights, strips of ground had been plowed and were in excellent condition for surface work, and yet no trace of aboriginal occupancy occurred in either place. Where the slope of the hill meets the flat and the velocity of the surface drainage waters would be checked is the natural place for wash of all kinds to be caught; but no pottery could be found there. Even the flat itself is devoid of pottery to a considerable distance from the hill slope. Such pottery as there is on the flat is bunched in two or three places with no regard to drainage lines. If the potsherds were washed from the hills, nearly as much would be found in the gully as on the flats nearby, whereas there is actually very little of this type of pottery in the gully. If it washed from the hills there should be much of it on the alluvial terrace, which is now receiving wash; but, instead, it is absent there. Only one conclusion seems possible in regard to the former location of these rectangular earth-lodge sites, and that is that they stood where the pottery now is, and since they rest upon the deposits over the old stream channel, their age is less than the filling of that channel.

Four feet below the surface of the gully there are occasional traces of charcoal in the secondary loess. This would seem to indicate that either the flats themselves or the hills above them had some human occupant at the time this portion of the deposit was forming. But as no artifacts were found at this level and as charcoal is a very unsafe basis from which to draw any conclusion in regard to human occupancy, the presence of man at that stage cannot as yet be proved. And if man lived there, nothing can be said of his culture.

Six feet below this, or ten feet below the surface, there occur



1. A BED OF ASHES WITH ANOTHER BED OF CHARCOAL ABOVE IT, THE TWO FORMING THE REMAINS OF A FIREPLACE



2. BY THE MAN'S KNEES IS THE LOWEST LEVEL OF FIREPLACES. THE SPOTS OF ASHES ABOUT THE LEVEL OF HIS WAIST SHOW THE SECOND LAYER. TRACES OF CHARCOAL WERE FOUND ABOUT THE MIDDLE OF THE HANGING ROOT. THE RECTANGULAR HOUSE TYPE POTTERY OCCURS NEAR THE SURFACE HERE

numerous ash-beds, and in a few places there are still other ash-beds two feet below the first group. These two layers are separated by a blue creek muck which probably did not take a great deal of time to accumulate. An important fact arguing against any great difference in time between the upper and the lower ash-beds is that the pottery and the flint and bone implements found in these two sets of fireplaces show absolutely no difference in type.

They differ, considerably, however, from the material found on the surface. The pottery is mainly of a blackish color and lacks entirely the sharp angle found at the neck of the surface pottery. It is usually decorated by finger-marks on the rim, but some pieces are cord-marked (I have no specimen of cord-marked pottery among the 1300 rims collected in the rectangular earth lodges). None of the fragments shows evidence that the vessels had lugs. Among the animal bones, those of the bison were the most common, while they are rare in the rectangular house sites. Charred corn is quite common in the earth lodges, but none of it was found in the fireplaces. Instead there were large numbers of gourd or squash seeds which have never been found in the other sites.

These lower sites have been traced for an eighth of a mile in a straight line along the creek. Borings show that the traces of human occupancy extend in places at least fifty feet back from the present walls of the gully. This argues either for a considerable number of persons in the settlement or for an extended occupancy. In many places along the creek but one of the layers of fireplaces occurs, and in these cases it is impossible to tell which layer is absent. In addition to the fireplaces, or ash-beds, there occur a few ash-dumps and an occasional pit. The artifacts which were found were nearly all broken fragments. No trace was found of deliberate storage of material.

Each place along the gully where the beds containing the fireplaces were found was given a number. These numbers ran from I to IX, and counting the lettered exposures between numbers, there were seventeen in all.

A typical section from top to bottom follows. This was taken on the southern end of exposure VII.

	FEET	INCHES
(1) Black organic soil		11
(2) Yellow clay much jointed. At a depth of four feet it contains traces of charcoal. Secondary loess.	6	9
(3) Light-colored clay with numerous dark bands	1	2
(4) Dark-colored clay with numerous light bands		11
(5) Light-colored clay with dark bands	1	
(6) Dark layer containing rocks, charcoal, ashes, and artifacts		5
(7) Light-colored clay with dark bands	1	
(8) Ashes		1
(9) Burned clay		2
(10) Dark, unbanded clay		

The question remains as to the age of these deposits. There are boxelder trees growing on the edge of the gully, immediately above ash-beds, which are eight feet or more in circumference. Other trees of still larger size grow along the gully but not immediately above the beds under discussion. The most important consideration in guaging the age of the deposits is that the material on the surface is entirely prehistoric. Not only in these particular sites, but in all the hundred or more of the rectangular house sites which have been examined, traces of contact with white people are altogether absent. The following is the series of events which has taken place. First, an ancient people made their homes in an old creek bed. They temporarily abandoned the site and later returned to reoccupy it. Then there followed the slow filling-in of the valley, a process which took at least two or three centuries. Then another people with another culture occupied the site. And finally either they changed some elements of their culture (such as the rectangular semi-subterranean lodge) before the coming of the whites or else the historic tribes form a third group of people to occupy the same region.

There is nothing in the cultural changes nor in the stratigraphic conditions to indicate geological antiquity. A thousand years is ample to account for all the phenomena, and the lowest beds may not be even so old as that. However, we must be careful to avoid the other danger of making our estimate too low. Wash from the hills would be very slow compared with the deposits of river flood-

plains. Sites buried in the latter might not be very old. Such sites have been found within two miles of the White farm. They consist of fireplaces at a depth of two to three feet in the river alluvium. They contain a type of pottery which is different from either that of the Walker Gilmore site or that of the rectangular lodge sites.

A detailed study of the different cultures is now being prepared and will be published later.

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THE USE OF GLUE MOLDS IN REPRODUCING ABORIGINAL MONUMENTS AT QUIRIGUA, GUATEMALA

By NEIL M. JUDD

IN January, 1910, the School of American Archæology commenced a series of investigations at the ruins near Quirigua, Guatemala. These investigations have been continued every year, with one exception, since that date, and during the operations of the winter of 1913–14, the most recent of the series, the author was a chance associate, having in charge that phase of the work which these notes consider.

The expedition of 1914 entered the field with two distinct motives: (1) a continuation of former excavations[1] on the structures surrounding the Temple Court, and (2) the reproduction in plaster of as many of the stone stelæ, for which Quirigua is so justly famous, as time and local conditions would permit. We shall concern ourselves, in the following pages, solely with the casting of the monuments.

Readers familiar with the history of Quirigua will recall that the ruins remained unknown to the scientific world until John L. Stephens published an account of his travels through Central America in 1839 and 1840; also that very little additional information was obtained until an English traveler, Mr A. P. Maudslay, made known the results of his observations at the old city during 1881–1883 and 1894. In addition to the usual notes, measurements, and photographs, Mr Maudslay obtained, on his last two visits, a number of paper squeezes and plaster piece-molds[2] of the great monuments in the Ceremonial Court or Plaza. These molds were taken to England and plaster casts made from them.

[1] See *Bulletin of the Archæological Institute of America*, vol. II, pp. 117–134 (1911), and vol. III, pp. 163–171 (1912); also *National Geographic Magazine*, vol. XXIV, pp. 339–361.

[2] A "paper squeeze" is the resultant negative impression when several superimposed layers of well-soaked paper are pounded into the superficial irregularities of an object and allowed to dry in place. A plaster "piece-mold" is a collection of individually-shaped plaster blocks that unite to form a complete mold.

Similar molds of the sculptured stones at this and other prehistoric Central American sites were obtained by subsequent expeditions, among which those of the Peabody Museum at Cambridge are most noteworthy. None of the paper squeezes obtained by these early expeditions, however, produced casts that are entirely satisfactory. Existing reproductions give a general impression of the original, to be sure, and are therefore highly desirable for museum exhibition, but their value for the study of the hieroglyphics has been lessened by the unavoidable inaccuracy and indistinctness with which they represent the carved inscriptions on the monuments. Such casts, the author believes, ought to serve both as museum examples of primitive American sculpture and as exact facsimiles for laboratory study of the ancient Mayan system of hieroglyphics.

FIG. 29.—Constructing the plaster forms around one of the stelæ.

The preservation of exact copies of Mayan monuments, and especially of their carvings, is quite necessary, for the action of the elements is slowly but surely erasing this evidence of primitive man's cultural development in the jungles of Guatemala. When

Maudslay made his first observations, these stones were almost hidden in the dense forest and were overgrown with a thick mat of vines and moss in which even large trees had taken root. He removed this growth in order to secure better photographs, but after his visit a new covering had formed, and the cleaning was necessarily repeated when the School of American Archæology began its investigations several years ago. When our party reached Quirigua last January, we found that a slight growth of lichens had reappeared on all the stelæ, but it readily yielded to a scrubbing brush.

FIG. 30.—Each form was made with liquid plaster, over a layer of clay mud.

These Quirigua monuments are of two types: tall stones with human figures carved on both faces and columns of hieroglyphics on the narrower sides, and low, animal-shaped blocks bearing similar inscriptions on their backs and sides. Each monument has been carved from a solid block of stone, of a texture that multiplies the difficulties of successful reproduction. The rock may be described as scoriaceous sandstone, for it consists mostly of volcanic scoria, with varying proportions of sand and coarse gravel. Earthquakes

1. THE "GREAT TURTLE"

Maudslay's plaster piece-mold of this monument required more than 600 pieces and about three months for completion; with glue molds, a finished cast in eleven parts was produced in fifteen days

2. COMPLETING THE PLASTER FORMS OVER THE "GREAT TURTLE"

and growing vegetation have broken and split these heavy masses, as well as the remaining walls of the temples; swaying branches and dripping water have cut and grooved their surfaces and liberated many exposed pebbles, thereby adding small pittings to the already rough, granular faces. Such a superficial texture greatly increases the difficulties of making satisfactory paper molds by resisting every effort to force pulp or similar lifeless materials into the pores of the stone's surface, and by tenaciously gripping those substances, once they have been driven into place. In reproducing the irregular texture of the Quirigua monuments, glue proved an ideal agent, since the material of the molds was applied in a liquid condition, and, when hardened, its natural elasticity permitted great distortion in removal. It was easily manipulated when properly prepared, yet gave considerable difficulty before its tropical limitations were sufficiently determined.

Glue, or gelatin, is an animal substance that deteriorates rapidly on exposure to heat and moisture. Commercially, gelatin is obtained in thin, dry flakes that require soaking and melting in preparation for use. Although well known and much utilized in decorative architectural construction in the cooler portions of the country, glue had never before been employed in the American tropics. Those experts whom we had consulted seriously doubted its practicability for such a task as ours—they were a unit in advising adherence to the old methods, despite admitted imperfections.

During our first weeks in Guatemala, while awaiting the arrival of supplies, we performed such minor experiments as available materials would permit. It became evident at this time that glue molds must be prepared with more care in the tropics than in the workshops of our New England states. For instance, a mere dampening of the dry flakes gave firmer, heavier molds that yielded more satisfactory casts than those made from glue which had received the customary soaking. Our first pourings were too thin and resulted in soft, rather sticky molds incapable of producing clear-cut reproductions. We learned also that melted glue, left in pails or tubs, would neither cool nor solidify, but deteriorated within a comparatively short time. After having served their purpose, our glue molds were usually cut into small pieces and remelted. When all

these fragments were not required for the evening pouring, they were dried and retained for future use, but if carelessly spread and a free circulation of air prevented, the pieces invariably sweated and soured, rendering them unfit for new molds. With all its uncertainties, however, glue proved an ideal medium for the hasty reproduction of such enormous, irregular carvings as those at Quirigua.

FIG. 31.—The edges of each form were carefully trimmed before an adjoining form was begun.

Our method of mold-making was very simple. We began by building a light plaster foundation around the base of the monument, to prevent the escape of the melted glue and to support the weight of the plaster forms which were to surround the monument and serve as retaining walls for the glue molds. Above this foundation, a definite section of the stone was covered with a layer of common clay mud, approximately one inch thick. In building the forms, such large quantities of this mud were used that one native was kept at work continually, mixing with his bare feet, while one or two companions kneaded it into sizable balls. These masses were then pounded or thrown onto the stone

with force sufficient to make them adhere, uniform thickness of the layer and its conformation with the outline of the stone being preserved during the operation.

Over this clay were built the forms or supports above referred to. While being constructed, each form was braced with two or more small saplings, laid at right angles upon a number of bamboo strips. Each form was completed and its edges carefully trimmed before the adjoining form was begun. Four of these forms, one for each side of the monument, composed a section. On completion, the several parts were bound together with temporary ties of plaster-soaked fiber and the working platforms raised for another series. Continuing in this manner, the whole monument was covered—a layer of clay, of a thickness corresponding to that of the desired mold, lying against the stone, and over this clay the carefully-matched plaster forms. When the topmost form had been finished, the real process of mold-making began.

Commencing at the top, one entire horizontal section was lowered each day and the subjacent layer of clay thrown aside. The exposed surface of the stone was then thoroughly scrubbed to remove what dirt and lichenous growth still clung to the monument. The inside surfaces of the four forms were scraped free from all irregularities and painted with a coat of thick clay-water which filled the pores of the plaster and aided materially in separating molds and forms. After the stone had dried, it was oiled with a composition of stearine, kerosine, and vaseline, and the forms raised to their original position, bound with fiber, and all joints covered with plaster. In their "original position" these forms were separated from the monument by an interstice equal to the thickness of the layer of clay over which they had been built. Into this space the melted glue was later poured. The resultant glue molds, therefore, were equal in thickness to the layer of clay they replaced; their backs were supported by the plaster forms, and their faces reproduced, in intaglio, the lines and carvings of the monument.

During these preparations, galvanized iron tubs, containing glue, were over the fires and their contents melting for the daily pouring. To avoid burning the material, that tub which held the glue was placed upon three or four small stones in a larger receptacle

and separated from it by a quantity of boiling water. The outer vessel, in turn, rested upon iron rods or pointed stones that raised it above the fire-pit. When the glue had thoroughly melted and attained uniform consistency, it was ready for the forms.

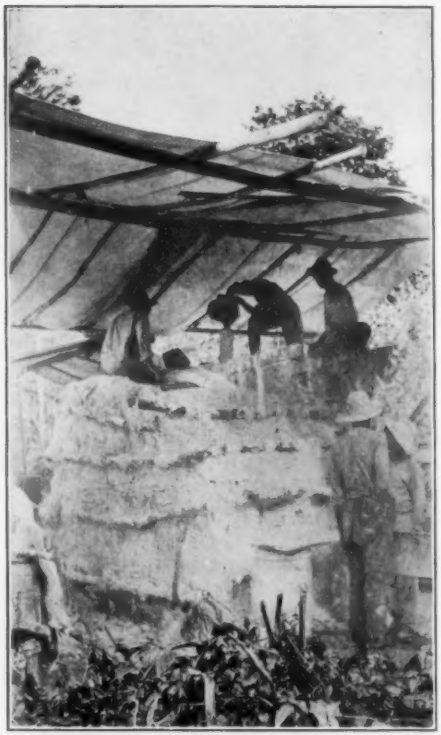

FIG. 32.—Pouring one of the upper molds on the "Great Turtle."

Pouring the glue was a simple process, and required only a number of pails and men to pass them. Our day's work was so divided that this operation was performed just before sundown, leaving the cool hours of the night for the hardening of the molds. Small holes for the escape of air bubbles were drilled through those forms that inclined from the perpendicular, but they were always reclosed as the melted glue, rising in the mold-space, began to flow from them. Further to prevent the formation of bubbles in the glue after it had been poured into the forms, improvised funnels were frequently employed, the pressure of the liquid remaining in the funnel after the forms had been filled forcing out the imprisoned air and also counteracting the effect of shrinkage along the upper edges of the molds.

1. PLASTER CAST FROM UPPER EASTERN SIDE OF THE "GREAT TURTLE"

2. THE BACK OF EACH CAST WAS REENFORCED WITH SAPLINGS AND ROPES OF PLASTER-SOAKED FIBER

The plaster forms had been built one against the other, therefore their joints were as tight and fitted as nicely as two reunited fragments of a broken dish. In order that the plaster casts might unite perfectly, the glue molds from which they were taken, conformed, necessarily, to the dimensions of their forms. The shrinkage of the solidifying glue left a narrow, unrecorded margin along the upper edge of each section of molds, an inaccuracy that was easily overcome by adding a low rim of plaster to the top of each series of forms. When filled with glue, these enlarged forms produced molds that were slightly wider than those desired, but the excess was easily

FIG. 33.—Retouching a section of the cast of a tall monument.

removed with a knife, leaving the glue molds flush with the original edges of their forms and assuring perfect joints when the sections should be finally united.

Each morning at daylight the glue molds poured the previous evening were lowered from the monument and prepared for casting. Great care was taken to protect these molds from even the early-morning sun, since only a few moments' exposure served to soften and melt the impression. The molds, supported by their respective plaster forms, were first dusted with French chalk, to remove any adhering grease, then thoroughly brushed with a saturated alum

solution. This liquid required, on an average, about one hour for complete evaporation, but it always left a thin coating of alum that hardened the surface of the glue molds and aided materially in protecting them from the heat generated by the setting of the plaster composing the casts. The mold surfaces were lightly oiled with stearine and kerosine before applying the plaster.

The casts were made by covering the oiled surface of each glue mold with liquid plaster, the thickness of which varied in direct proportion to the size and irregularity of the mold. Wooden braces and hemp fiber, imbedded in the plaster, increased the toughness of the casts and lessened the possibility of their warping and breaking.

Each horizontal section of the stelæ, or upright monuments, consisted of four casts which were usually united before being separated from the glue molds. Since the plaster forms were made in close conformation with the outline of the monument, their corner angles were known to be exact. By matching these corners and uniting the four parts of the newly-made plaster cast while they still rested against the glue molds and their supporting plaster forms, the angles of the cast could be made as perfect as those of the stone whose inscriptions it reproduced. Any other method would have required numerous measurements and much care in using them. Our way merely necessitated uniform setting of the plaster composing the detached parts of the cast and a reasonable amount of speed in joining them, for, even with an alum-hardened surface, the heat of the setting plaster soon melted the glue molds.

The climate was, of course, the greatest handicap under which the expedition labored. We reached Quirigua at the beginning of the dry season, a ninety-day period during which the rains are more irregular and of shorter duration than usual. Available 1914 records for this interval, February, March, and April, show an average daily temperature, as observed on the shaded veranda at the nearest United Fruit Company farmhouse, of 66° at 6 A.M.; 88° at noon; and 76° at 6 P.M. In the small, open space where our work of reproduction was pursued, the heat was obviously higher and more unbearable. Under the intense rays of the sun, not only the nature of our medium but also our personal comfort required a temporary

shelter over the monument being cast. To afford this necessary protection, canvas tarpaulins were drawn over poles that reached above the monument, drop curtains being utilized when driving rain-storms or the afternoon sun threatened the exposed portions of the stone.

Inability to secure cool water for casting increased the difficulties of that important branch of the work, made the setting of the plaster both irregular and uncertain, and required more haste in handling the materials than would otherwise have been necessary. A second vexing problem was encountered in the drying shed where minute worms developed a habit of exploring the interior of our plaster casts. Their prodigious appetities seemed insatiable, and the partial destruction of our season's work was avoided only by frequently exposing each cast to the direct rays of the burning sun.

FIG. 34.—Plaster cast of a "Death's Head" from one of the stelæ.

For shipment, the casts were enclosed in wooden crates and protected with dried banana leaves. The fact that they survived the shock of repeated loadings and unloadings and reached their

destination with very little breakage was due to generous and careful reënforcement rather than abundant packing.

The recent expedition entered the field with no previous experience and but very little knowledge of the use of glue molds. It employed a medium that had been considered impracticable in the torrid zone, but which, at comparatively small cost, has given results far surpassing those secured by any other process. In four months casts were made of six colossal monuments, and each cast, on close examination, will be found to be an exact counterpart of its original, reproducing not only every carved line and figure of the ancient sculpture but the very texture of the stone in which the carving was done. These reproductions are to be installed at San Diego, California, during the Panama-California Exposition, and later will be removed to the halls of the School of American Archæology at Santa Fe, New Mexico.

UNITED STATES NATIONAL MUSEUM
WASHINGTON, D. C.

INTERGLACIAL MAN FROM EHRINGSDORF NEAR WEIMAR

By GEORGE GRANT MACCURDY

THE attention of prehistoric archeologists has long been turned toward the region of Weimar, Germany, because of important discoveries made at Taubach and Ehringsdorf, both in the Ilm valley. Known since 1871, the station of Taubach (back of the village of that name) was systematically explored between 1876 and 1880. The deposits at Taubach and Ehringsdorf are alike. Their basis is a layer of sand and gravel dating from the third or Riss glacial epoch (Obermaier). Above this is lower travertine with remains of the mammoth and woolly rhinoceros near the bottom, and those of *Elephas antiquus* and *Rhinoceros merckii*, both witnesses of a warm climate, near the top. Next above at Ehringsdorf comes the so-called "Pariser" (corruption from Poröser) deposit, a kind of loess. Higher still is a deposit of upper travertine with remains of the stag and woolly rhinoceros; curiously enough the *Rhinoceros merckii* also occurs at this level.

The human remains in question, consisting of a nearly complete human lower jaw, form the subject of a paper just published by Professor G. Schwalbe[1] of Strassburg. Professor Hans Virchow was to have given a demonstration of the specimen before the German Congress of Anthropology at Hildesheim last August, but the Congress was not held on account of the war. The discovery was first brought to my attention through a letter from Dr L. Pfeiffer of Weimar under date of July 20, 1914. Like much of the archeological material previously found at Taubach and Ehringsdorf, the lower jaw is now the property of the Museum at Weimar. Because of its double association with that city, Schwalbe proposes to call it the Weimar lower jaw.

[1] Über einen bei Ehringsdorf in der Nähe von Weimar gefundenen Unterkiefer des *Homo primigenius*. *Anat. Anzeiger*, Band 47, 337–345. 1914.

The lower jaw was found on May 8, 1914, at a depth of 11.9 m. below the surface in the lower travertine, 2.9 m. below the so-called Pariser loess. It is from the Kämpfe quarry at Ehringsdorf and was brought to light by means of a blast. Under the circumstances it was fortunate indeed that the lower jaw suffered no worse. All the teeth are intact and in situ save the two right incisors (in their place is a small mass of travertine containing a univalve shell). Both halves of the body are practically complete. The right ascending ramus is in part present; although not enough remains to save the mandibular angle, the coronoid and condyloid processes, and the mandibular or sigmoid notch. The left ascending ramus is completely gone.

A number of remarkable features are combined in the Weimar lower jaw. The absence of a chin is doubly emphasized because of the pronounced alveolar prognathism (figs. 35, 36), a condition

FIGS. 35, 36.—Right and left profiles of the Weimar lower jaw. After Schwalbe. (½)

not found in the lower jaws of Krapina and La Chapelle-aux-Saints, nor even in that of *Homo heidelbergensis*. Closely related to the alveolar prognathism is the sloping nature of the inner surface of the jaw in the region of the symphysis, the region called by Schwalbe planum alveolare. In all other lower jaws of the Neandertal type a median line in this field is much more nearly vertical. Below this planum alveolare is a spinous area, but no distinct spines for the attachment of the genioglossal and geniohyoid muscles. Neither is there the customary ridge on the inner surface of each corpus for the attachment of the mylohyoid muscles. The absence of this mylohyoid ridge is even more marked than in the well-known mandibles of the Neandertal type.

The foramen mentale (see figs. 35, 36) is unusually large. It

is directly beneath the first molar (similar to the situation in *Homo primigenius*); while in recent man this foramen is situated farther forward beneath the second premolar. In the Heidelberg lower jaw it is also large, but is situated farther forward than in the specimen from Weimar.

Schwalbe lays special stress on the narrowness of the arch of the Weimar jaw. The breadth between the inner faces of the third molars is 48 mm.; the distance from posterior surface of the third molar to the anterior margin of the median incisor is 69 mm. The index derived from these two measures in the Chimpanzee is 54.6. In the Weimar jaw this index is 69.5; while it is much larger in other known fossil human lower jaws: Heidelberg 75.7, Krapina 80, and La Chapelle 100. Schwalbe admits, however, that the low index of the Weimar jaw might be due in part at least to post-mortem deformation.

FIG. 37.—The Weimar lower jaw. After Schwalbe. (⅗)

The teeth are much worn (fig. 37). Since the premolars are less worn than the canines, one is led to conclude that the points of the canines stood above the level of the premolars. There is no diastema between the canines and the first premolars. A notable feature is the relative smallness of the third molars. This unexpected condition proves that the tendency of the third molars to disappear is of much more ancient origin than other known jaws of the Neandertal and earlier types have led us to suppose.

Without hesitation Schwalbe places the Weimar lower jaw in the Neandertal group, for which group he proposed some years ago the

name *Homo primigenius*. In the preliminary paper he does not describe the cultural remains found at the same level. He does, however, mention some of the numerous accompanying fauna: *Rhinoceros merckii*, stag, horse, ox, and cave bear. There was also an abundance of charcoal and flint implements, the latter for the greater part apparently retouched points and scrapers.

Two human teeth (one of a child and one of an adult) had already been found in the lower travertine of Taubach. During the summer of 1908 Dr Pfeiffer found human skull fragments in the same deposits at Ehringsdorf.

Both Obermaier and Schmidt consider the lower travertine of Ehringsdorf (the deposit in which the lower jaw was recently found) and Taubach to be older than Mousterian. Although it contains no typical coups de poing, on account of the character of the fauna as well as of the industry, Obermaier would call the deposit of Chellean age. For Schmidt, who has recently published examples of the industry, it is Acheulian.

In any case, all are evidently agreed that the deposit belongs to the Riss-Würm interglacial epoch. In that case, according to one school it might be Chellean, Acheulian, or early Mousterian; according to the school of Penck, it would have to be later Mousterian, since he places early Mousterian during the Riss glacial epoch and the Chellean-Acheulian during the second or Mindel-Riss interglacial epoch.

Whichever view is correct, on account of its anatomical characters as well as the position of the deposit and the nature of the associated cultural and faunal remains, the anthropologist may justly claim for the Weimar lower jaw an antiquity surpassed perhaps only by the skull of Piltdown and the Mauer (*Homo heidelbergensis*) lower jaw.

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CERTAIN FURTHER EXPERIMENTS IN SYNÆSTHESIA[1]

By CHARLES PEABODY

IN January, 1914, a questionnaire in the following form was sent to all the members of the American Anthropological Association and of the American Folk-Lore Society:

It has occurred to me that the members of the American Anthropological Association and of the American Folk-Lore Society could possibly help me in the matter of a questionnaire on certain aspects of child study.

Would it be possible for you to furnish me with answers to some or all of the following questions addressed to children of your family or acquaintance?

1. When thought of in a series do the numbers from 1 to 50 form a figure of any definite shape or do they present to the mind a straight line? If a figure, can you set it down; if a straight line, how does it appear? (Please set down the fifty numbers on the paper as they appear to you.)

2. Do the hours of the day, the days of the week, and the months of the year, when thought of consecutively, suggest a straight line, a curve, a circle, or other figure? Will you arrange on the paper the hours, days, and months as they appear to you?

3. Do the letters of the alphabet arrange themselves in your mind in any figure, and if so can you set it down?

Name, age, and notes on the disposition of the child.

The undersigned would be very glad to receive any information as to the ideas of children up to fifteen years, on these subjects and on any others related to them.

Later, an identical questionnaire, with only such changes as made it suitable to those of riper years, was sent to each instructor of Phillips Academy, Andover, Massachusetts, with the kind permission of the principal.

Of the former set, 600 or 700 in number, about 130 were returned with answers; these included about 40 from one member of the

[1] In preparing this preliminary report, it is a pleasure to record my sincere acknowledgments for aid and suggestions to Professor Mary Whiton Calkins, Professor of Psychology in Wellesley College; to Dr Louis N. Wilson, Librarian of Clark University; to Dr Benjamin Rand, Librarian in Emerson Hall, Harvard University; to Dr Alfred E. Stearns, Principal of Phillips Academy, Andover, and to Dr Ernest C. McDougle of Clark University.

American Anthropological Association in Houghton, Michigan, who collected the answers from the school children he was enabled to approach. Deducting these, we have a residue of 80 or more, rising ten percent of the inquiries; this should be considered a good result from a questionnaire issued broadcast geographically and without authority to compel answers.

The general indifference to questionnaires on the part of that class of people supposedly most interested in the subject, may here be noted, as it has heretofore by the author and by one of the most important writers on the subject as well.[1]

The response from Phillips Academy has been more remunerative, but many of the answers arrived too late for inclusion. With good fortune it is hoped to obtain a fair report from nearly all the students (more than 500), and that the most interesting experiment especially urged by Professor Calkins, of trying the "persistency of forms" after the lapse of some months, may be carried out.

Mr A. E. Bostwick, Librarian, of St Louis, and others, as well as the author's own researches, bring out a considerable literature on this subject. In the lack of more complete information the interest seems to lag somewhat at present. A few of the more important articles on the subject are appended;[2] they are more likely to deal with what the French well term "synopsie" than with the very broad "synæsthesia," including color-audition, etc.

Prior to the time of preparation, 160 answers that were of use were received, and there follow a number of summaries of these answers that in great measure are self-explanatory. They are also arranged in such a way as to afford easy comparison with the published summaries of Galton, Phillips, Miss Calkins, and Manouvrier.

[1] Cf. Flournoy, Th., *Les Phénomènes de Synopsie*, Geneva, 1893, p. 12.

[2] Galton, F., in *Jour. Anthr. Inst. G. B. and Ireland*, 1880–81, pp. 85 ff. Galton, F., Inquiry into Human Faculty, London, 1883, pp. 114 ff. Whiting, Margaret C., in *Pedag. Sem. Clark Univ.*, 2, 1892–93, pp. 107 ff. Flournoy, Th., *Phénomènes de Synopsie*, Geneva, 1893. Patrick, G. T. W., in *Pop. Sci. Month.*, 1892–93, pp. 504 ff. Calkins, M. W., in *Amer. Jour. Psychology*, 1892–93, pp. 439 ff.; ibid., 1895–96, pp. 90 ff. Phillips, D. E., in *Amer. Jour. Psychol.*, 1896–97, pp. 506 ff. Hornbrook, Adelia R., in *Educ. Rev.*, v, pp. 467 ff. Manouvrier, L., in *Bull. et Mém. Soc. d'Anthr. de Paris*, 1908, pp. 584 ff. Pierce, A. H., in *Psychol. Bull.* (reviews, etc.), volumes for 1911, pp. 56 and 157; for 1912, p. 179, and for 1913, p. 118. McDougle, Ernest C., in *Pedag. Sem. Clark Univ.*, 1914.

For convenience, directions have been omitted and the points of the compass used instead as conventionalized on the map.

In the instances, not a few, marked "indefinite," the obvious interpretation is along the line of least resistance, a straight line or a circle, as the case may be.

The bugaboo of receiving false or "faked" answers from the numerous youths who do not take these things seriously has more or less vanished, since study of others' researches has shown how similar are the wildest extremes of a supposititious imagination, and since a little reflection will show that an absolute fake is well nigh impossible. The "faking" mind will again run along the line of least resistance, and any fantastic figure is likely to be the result of a more or less unconscious preëxisting mental picture.

Under "Varia" are reported most of the very interesting figures;

SUMMARY I

	NUMBERS	HOURS	DAYS	MONTHS	ALPHABET
Straight line to north	8	3	1	3	0
Straight line to northeast	4	1	0	2	3
Straight line to east	70	16	51	39	81
Straight line to southeast	0	0	3	0	1
Straight line to south	19	11	18	18	9
Straight line to southwest	0	0	0	0	0
Straight line to west	0	0	3	0	0
Straight line to northwest	0	0	0	0	0
Straight line indefinite	16	5	20	6	14
Broken line to north	3	0	0	1	0
Broken line to northeast	9	0	1	0	0
Broken line to east	3	0	6	2	3
Broken line to southeast	1	0	2	2	5
Broken line to south	0	0	0	0	0
Broken line to southwest	1	0	0	0	0
Broken line to west	0	0	0	0	0
Broken line to northwest	3	0	0	0	0
Broken line indefinite	0	0	0	0	1
Circle, north-east-south-west	0	59	5	16	0
Circle, north-west-south-east	0	2	4	9	0
Circle, indefinite	0	18	7	14	1
Varia	19	22	18	29	20
No figure	3	8	7	5	12
No answer or wrong answer	1	15	14	14	10
Total	160	160	160	160	160

as a whole, however, in the summaries, no answer that can be included under any other head is put under Varia.

Percentages have been worked out for convenience in comparison with others' work.

In order to determine what is the true proportion of real "forms" and the varying character of these "forms," a few additional tables are presented, showing the proportion of straight and broken lines, circles, etc.

SUMMARY II

	NUMBERS		HOURS		DAYS		MONTHS		ALPHABET	
		%		%		%		%		%
Straight line	117	.731	36	.225	96	.600	68	.425	108	.675
Broken line	20	.125	0		9	.056	5	.031	9	.056
Curve	5	.031	0							
Circle			79	.494	16	.100	39	.244	1	.006
Varia	6	.038	22	.137	18	.113	29	.181	20	.125
No answer or wrong answer	1	.006	15	.094	14	.087	14	.088	10	.063
No figure	3	.019	8	.050	7	.044	5	.031	12	.075
Residue	8	.050								
Total	160	1.000	160	1.000	160	1.000	160	1.000	160	1.000

SUMMARY III

	NUMBERS		HOURS		DAYS		MONTHS		ALPHABET	
		%		%		%		%		%
Straight line, east and south, and indefinite	105	.656	32	.200	89	.556	63	.394	105	.656
Circles, north-east-south-west, and indefinite			77	.481						
No answer, wrong answer, or no figure	4	.025	23	.144	21	.131	19	.119	22	.138
Remainder	51	.319	28	.175	50	.313	78	.487	33	.206
	160	1.000	160	1.000	160	1.000	160	1.000	160	1.000

SUMMARY IV

Unusual figures	23	.144	31	.194	24	.150	33	.206	22	.138
Remainder	137	.856	129	.806	136	.850	127	.794	138	.862
	160	1.000	160	1.000	160	1.000	160	1.000	160	1.000

COMMENT

The influence of feelings for direction may be instantly seen. Whatever the truth about the causes of visualization, whether with Flournoy we invoke the three types of association or with Phillips refer the phenomena to space concepts, there is not the slightest doubt that the "associations" with arithmetics, spelling-books, and later reading are to be eliminated at the outset.

The proportion of straight lines "east and south" in the whole number is due largely to these associations and memories.[1] If we read as the Chinese, or wrote as the earlier Greeks, "Boustrophedon," the proportion would not be so large. Add to this the unconscious feeling for gravitation, and it seems surprising that there are any linear visualizations other than the horizontal right and vertical down.

That reading is perhaps as potent a factor as the memory of juvenile text-books is seen in the large proportion of the "east" in the sum total of the "east and south" lines for the number and alphabet columns.[2]

A search in the Harvard and Departmental Educational libraries in Cambridge shows that for the last seventy-five years there has been no rule in printing the numbers and the letters on the page where the children supposedly first see them. They run sometimes horizontally and sometimes vertically, and with the letters sometimes in groups coming under both heads.

A few of the extraordinary geometrical forms associated rarely by the subject with numbers or letters may hark back to the counting by repeated figures or shapes somewhat in vogue at present. This process would surely help a child who is inclined to visualize.

Naturally, in the case of the hours, days, and months, the proportion of straight lines is smaller.

Why the days arrange themselves so much more readily in lines than the months (a percentage of .600 compared with .425) is not clear. Like the expressions "All the year round" and "The revolv-

[1] One hundred and five in 117, 32 in 36, 89 in 96, 63 in 68, 105 in 108, respectively. (The "indefinite" lines are included in the same class as the "east and south," since, if the subjects who simply wrote "straight line" had other directions in mind, they surely would have mentioned that fact.)

[2] Seventy in 89, and 81 in 90, respectively.

ing year," the month concepts probably have an astronomical basis lacking in the case of the weeks, which are but a part of the less obvious lunar month.

For the hours it goes without saying that the clock-face is responsible for the "circles, N., E., S., W." (48% of the whole). That 52% of the subjects resisted or escaped such an obvious stimulus to imagination is remarkable.[1]

It is probable that the "no figures" should be added to the straight-line columns, but these are not many and would change the proportion but little. This should apply to the hours as well as to the other four titles.

In Galton's series of number forms the clock-face was nearly negligible. This is strange, unless it is because the figures on the clock are so often Roman, and do not affect the visualization of the Arabic.

In one of Miss Calkins' summaries,[2] where the same titles for questions were taken, the proportion of results is different. Of 67 answers we here have, for number-forms—

Straight lines	17
Broken lines	31
Curves	12
Not recorded	7
	67

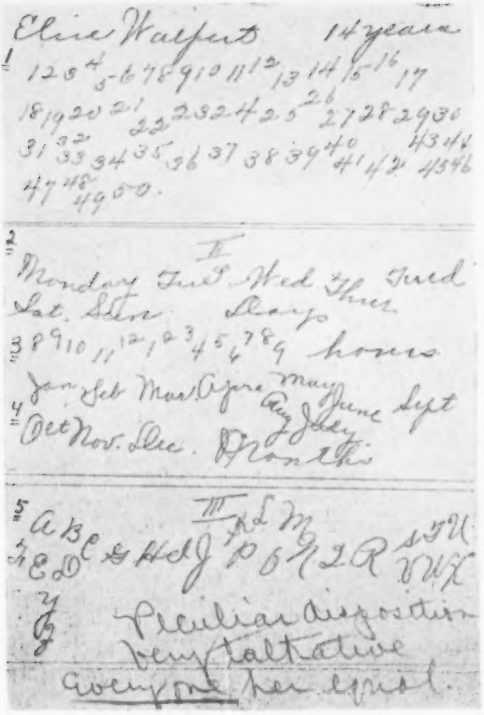
Some of the discrepancy may be accounted for if, during her investigation (involving many more than the 67 subjects), only extraordinary straight lines were accorded a place in the list of true "forms."

Summary III begins an attempt to get at the relative frequency of visualizations in the more restricted sense. Ruling out all straight lines "east" and "west," and of course all "no figures" and erratic or absent answers, the remainder may fairly be treated as visualizations.[3] There is one obvious exception: the normal circle should be excluded in the case of the hours.

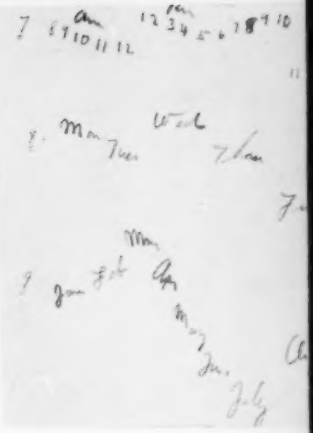
[1] The circles marked "indefinite" have here been included with those marked "N., E., S., W." for the reasons given in the recent note.

[2] *Amer. Jour. Psychol.*, 1892–93, p. 449, summary XIII.

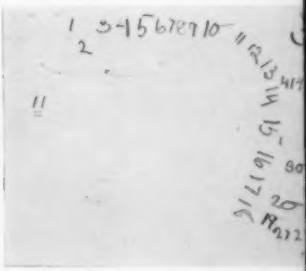
[3] The "indefinite" are here treated as before.



1. 2. 3. 4. 5



7 8. 9.



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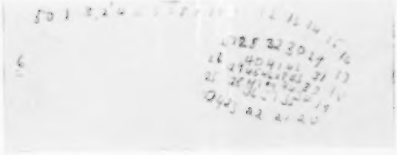

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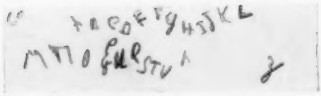

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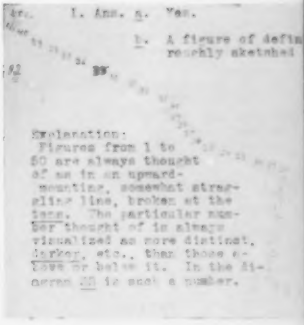
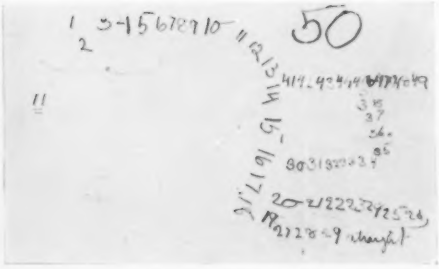

Explanation:
Figures from 1 to 50 are always thought of as in an upward-mounting, somewhat straggling line, broken at the tens. The particular number thought of is always visualized as more distinct, darker, etc., than those either above or below it. In the figure 25 is not a number.

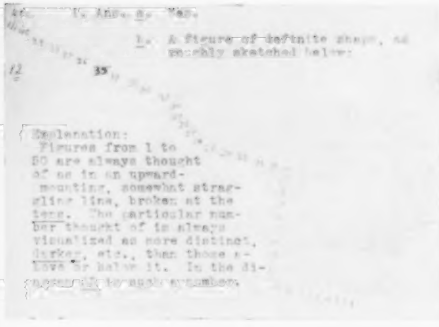
12

Mon
Tue
Wed
Thu
Fri
Sat
Sun
January
February
March
April
May
June
July
August
September
October

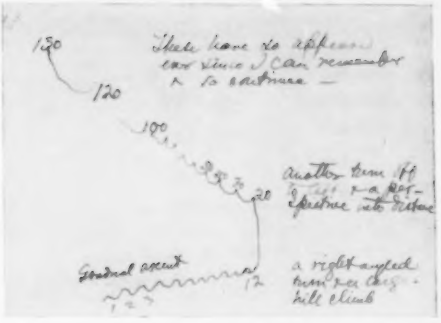
7 8. 9.


50

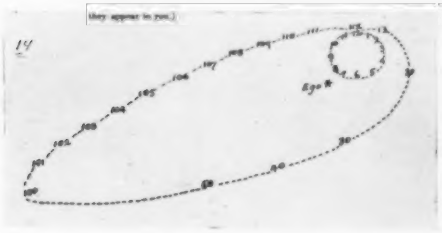
11


b. A figure of definite shape, as roughly sketched below:
Explanation:
Figures from 1 to 50 are always thought of as in an upward-mounting, somewhat straggling line, broken at the tens. The particular number thought of is always visualized as more distinct, darker, etc., than those above or below it. In the di-
to mark a number.

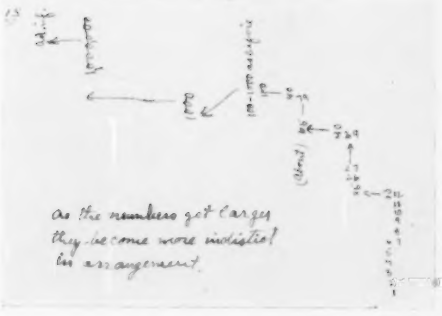
12


120
120
100
20
Gradual ascent
12

13


(they appear in pairs.)
14
190
30
20

14


15
as the numbers get larger
they become more indistinct
in arrangement

15

After all this is done, we have in percentages:

Numbers	Hours	Days	Months	Alphabet
.319	.175	.313	.487	.206

SUMMARY V

Proportion of Forms by Titles

	Forms	Percentage	Rank
Numbers	51	.213	2
Hours	28	.117	5
Days	50	.208	3
Months	78	.325	1
Alphabet	33	.137	4
Total	240	1.000	

Compare this with a similar table from Miss Calkins:[1]

	Forms	Percentage	Rank
Numbers	67	.279	2
Hours	5	.021	5
Days	50	.208	3
Months	73	.304	1
Alphabet	45	.188	4
Total	240	1.000	

Compare also with a less complete result by Phillips:

	Forms	Percentage	Rank
Numbers	147	.351	2
Week	34	.082	3
Month	214	.512	1
Alphabet	23	.055	4
Total	418	1.000	

In all three tables the order is the same—months, numbers, days, and alphabet, with the hours (omitted by Phillips) coming in fifth in Miss Calkins' and the writer's results.

In spite of the different gathering ground of Miss Calkins' questionnaire and the present one, the proportion of day-of-the-week forms is exactly the same.

[1] Op. cit., p. 440, summary II.

The total number of forms considered (240) in the two tables is the same, but this is a pure coincidence.

A more rigid classification of the replies received is seen in the next table.

In studying the returns, notes or copies of the more extraordinary visualizations were set down. A few of these may be included under the more ordinary titles heretofore given.

SUMMARY VI

Proportion of the More Striking Visualizations

	NUMBERS		HOURS		DAYS		MONTHS		ALPHABET	
		%		%		%		%		%
Visualizations.....	23	.144	31	.194	24	.150	33	.206	22	.138
Remainder.....	137	.856	129	.806	136	.850	127	.794	138	.862
Total.....	160	1.000	160	1.000	160	1.000	160	1.000	160	1.000

This table gives the relative order of months, hours, days, numbers, and alphabet. The first holds its place, while the hours come up and the numbers go down and the days remain the middle term.

When it comes to the problem of determining what proportion of individuals visualize, results are difficult to obtain.

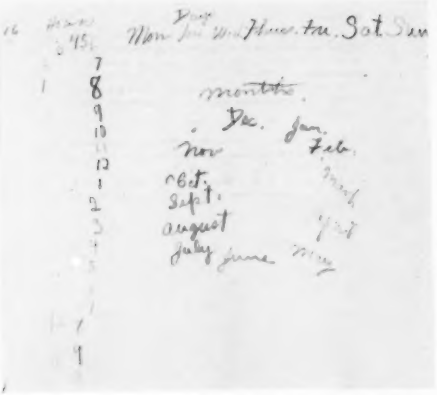
It is hard to frame a questionnaire in such a way as to elicit all one knows without suggesting answers; it is hard to overcome an absurd but natural shyness in those who visualize and to persuade those who do not that there is anything in it.

With all the good will in the world, neither child nor adult can describe at the first all he knows, nor does he know all there is to say about himself until he has examined himself very thoroughly.

In many cases of tridimensional forms, children do not know how to express themselves, and an interesting form will be reported as "just a straight line." An approximation to the proportion of those having forms may be made, however.

Of all the answers, 160 in the aggregate, 74 (or 46%) contained a form of some sort and 23 (or 14%) had number forms.

As it is hoped that the Andover answers are as yet far from all in, a fairer proportion may be found by omitting the 39 Andover answers. Of the 128 that are left, 54 (or 42%) have forms.



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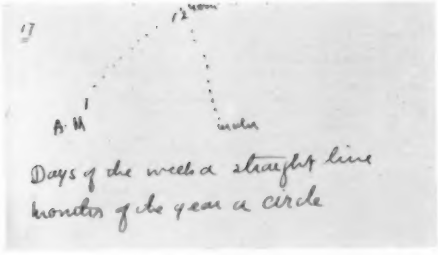

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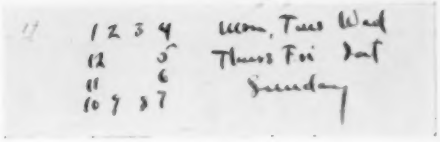

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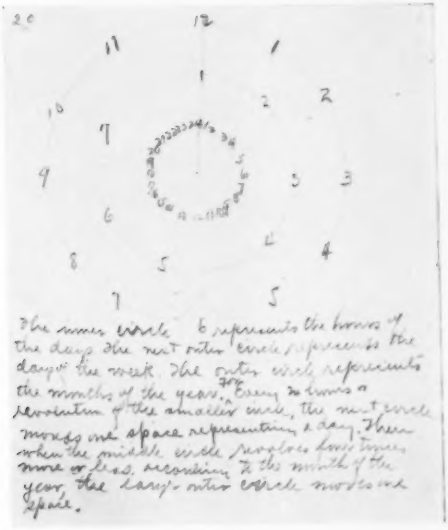
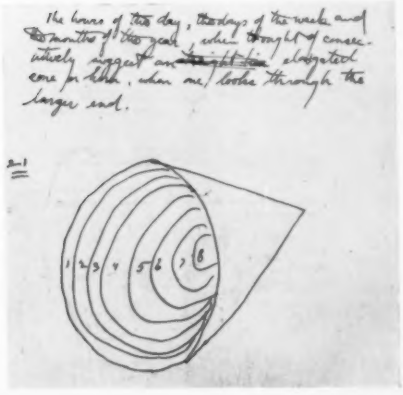

20
12
1
2
3
4
5
6
7
8
9
10
11
The inner circle represents the hours of the day the next outer circle represents the days of the week. The outer circle represents the months of the years. Every 24 hours a revolution of the smaller circle, the next circle moves one space representing a day. Every when the middle circle revolves four times more or less, according to the length of the year, the days outer circle moves one space.

20


The hours of the day, the days of the week and months of the year, when thought of consecutively suggest an straight line elongated one or the other, when we looke through the larger end.
2 in 1
1 2 3 4 5 6 7 8

21

Of course, to obtain the 128 answers and the 54 forms, about 700 circulars were sent out. If it is assumed that all who did not answer were not endowed with any forms at all, the proportion is 54 in 700, or about 8%. But this is not the case. Indifference, carelessness, and lack of opportunity let slip many instances where forms could have been recorded.

The 42% is entirely too high, as would be any ratio derived from positive answers; the 8% is too low. The mean of these is 25%, and this may represent a general average of the number of those who possess some definite visualization in space of at least two dimensions under the five titles indicated.

Results obtained by other investigators vary considerably; they are not, however, based always on the same number of types of visualizations. Galton's ratio, in his paper on number forms, is much less than 25%. Flournoy gives about 11% for "visual schemes"; Phillips gives 7% for number forms. Miss Calkins gives several ratios, of which the mean is about 28% for forms; and Phillips again thinks that "all have some idea of the extension of number."

To sum up, 25% is probably too high, but not very much so for the proportion of those who possess forms of some type. There are many others that could be inquired into, and some of them have already been studied—years, centuries, colors of the spectrum, parts of speech, etc.

More interesting is the fact that many who have no forms under one title may possess several under others. The following table will bring this out.

SUMMARY VII

Subjects with all possible (five) forms	2	or	10 forms
Subjects with 4 forms	4	or	16 forms
Subjects with 3 forms	10	or	30 forms
Subjects with 2 forms	19	or	38 forms
Subjects with 1 form only	39	or	39 forms
Subjects with 0 form	86		
Total	160 with 133 forms		

From the subjects with but a single form to those with all, there is almost an exact geometrical progression with a ratio of one-half. This is rather striking, and not at all what one would expect. The rate of diminution should, it would seem, be more rapid.

Besides the general observation we have seen, a few particular instances may be noted.

In the answers on numbers, emphatic numerals which may or may not have some logical connection with the subject or a related object are not infrequent; the same is true of the alphabet, and in lesser degree of the other titles where the chronological position of the observer is of considerable moment.

Tridimensional concepts, perspective, "away from the individual," "straight out and then down," or "to a vanishing point," are not common, but are found under all five headings. They are probably much more numerous, as observed above, than is set down in the imperfect expressions of the subjects.

One correspondent reports numbers as representing historical scenes. This is unusual, whereas personality and, still more, color ideas are far from uncommon. It seems impossible, from what the writer reads and feels, that there should be many without some color scheme for the objects of the sister senses.

In the series under hours, of the answers in the form of circles N., E., S., W., 56 (or 95%) begin at the north, or top, as do the hours on the clock.

The ordinary visualization of the days of the week in a straight line to the east and south presents some variety in the opening day.

SUMMARY VIII

Week beginning on Sunday	17, or	25%
Week beginning on Monday	44, or	64%
Week beginning on Saturday	1, or	1%
Week undetermined	7, or	10%
Total	69, or	100%

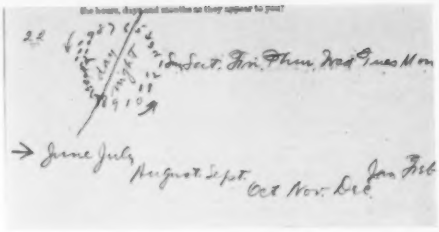
Of the more normal series of the months (i. e., straight lines E. and S., and circles N., E., S., W., and N., W., S., E.) the figures run:

SUMMARY IX

Months beginning with January	67, or	82%
Months beginning with September	1, or	1%
Months beginning undetermined	14, or	17%
Total	82, or	100%[1]

It may be of interest to state that the only clear visualization of the writer is that of the months which begin with January at the

[1] In Summaries VIII and IX the indefinite is not included.



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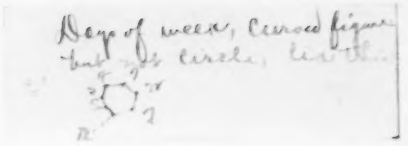
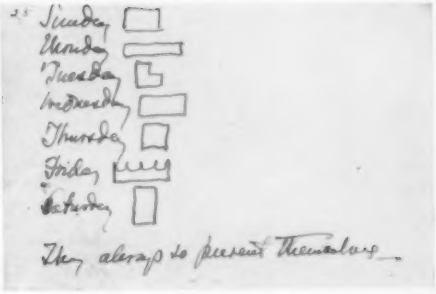


23

Days of the week.
The child stated that the innermost compartment represented Sunday, the outer compartment Saturday, and that each compartment should be marked with the abbreviation for the day of the week, e.g. Sun., Mon.
Diagram representing the twelve months.
The child stated that "the figures are supposed to be oblong and all of the same size". The figure at the left represents January.

24



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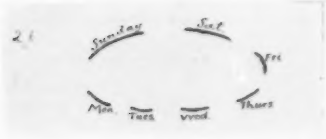

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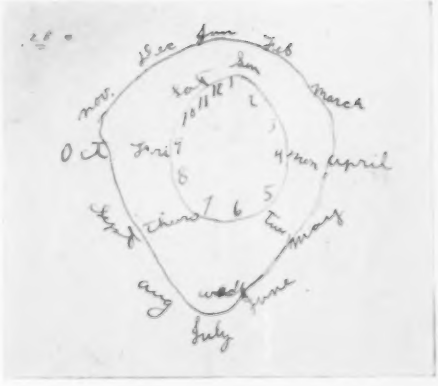


28

bottom of a circle running S., E., N., W., or contrary to the hands of a watch.

The practical question as to whether use can be made in pedagogy, or in calculation, memorizing, or recitation, of the forms, seems in a fair way of being settled in the affirmative.

Miss Calkins reports a slight preponderance of "not useful" answers, but, as has been pointed out, that is not equivalent to "detrimental." Mlle Diamandi uses her scheme as a kind of frame for her weird and abnormal calculations (see Manouvrier's article), and visualization is of immediate use to one clergyman who was good enough to answer the present questionnaire: "I think, calculate, think of history, dates therein, etc., practically wholly in mentally visualized words and figures—remembering passages in books, the Bible, sermons from typewritten manuscripts, etc., by mentally seeing the words and then simply reading them off."

The faculty of visualization seems quite normal. To be sure, one of the two subjects who sent in five figures is marked by her teacher as "peculiar," but beyond this the present series permits few generalizations. Whether a dull stupid subject would be likely to abound with results may be doubted. The faculty is one of intelligent healthy nature.

Appendix

Figures 1–5 and 6–10 are given not because of any inherent interest but to give the complete picture of the forms under all five titles as seen by the subjects.

Figure 11 (given by the writer's third daughter) is remarkable for the peculiar angles at the breaks, for the breaks themselves which do not follow any decimal or duodecimal rule, and for the separate, floating line of figures 41 to 49.

Figure 12 has decimal breaks, but is a good example of the rare northwesterly direction.

Figure 13 acts like a boomerang cavorting in scallops; very rare.

Figure 14 is altogether extraordinary; it looks as if suggested by an astronomical plan of stellar orbits, with the ego as the sun.

Figure 15, with the rare northwesterly resultant, has no rule for the breaks whatever; the writer's young friend who showed him this scheme is responsible thereby for the whole investigation.

Coming to the hours, figure 16 presents a vertical ellipse which, however, contrary to custom, is not closed.

Figure 17 is not illogical; the slow ascent to noon and the rapid descent to midnight may represent a working day.

Figure 18 is quite illogical and presents the phenomenon of crossing lines.

Figures 19 gives the hours in a square, certainly not suggested by the ordinary clock.

Figure 20, with the hours, days, and months revolving in concentric circles, is self-conscious but convincing.

Figure 21, "a cone looked at from the larger end," is unique.

Figure 22 seems also of astronomical provenance; the division into day and night equally is not uncommon.

Days: Figure 23, heptagon arranged contrariwise to the hands of a watch is certainly ingenious. Likewise figure 24, seven squares arranged like a Chinese puzzle.

Figure 25 smacks a little of the kindergarten, but is probably quite authentic and original; it is unique in this series.

Figure 26, one of the few closed curved day-forms, also runs contrary to the hands of a watch.

Figure 27, with the days principally on one side of a circle, is described as "constantly turning."

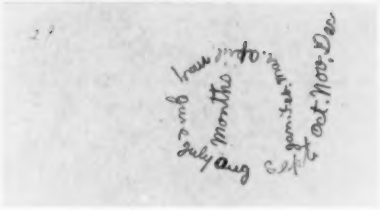
Figure 28, with the days mostly on the left of a circle, has a large lacuna between Sunday and Monday; this may be due, as is the great number of weeks beginning on Monday, to the school work which begins on that day and between which and the joy of Sunday there is a great gulf.

Months: Figure 29, a small spiral, projects December into space toward the northeast.

Figure 30. The months appear as steps mounting strangely to the northwest, with a figure on the top, at December. "Months represented as people coming down stairs." Something like this is given by Flournoy (fig. 73, p. 173), but the steps ascend normally to the northeast.

In figure 31 the point of view, probably the ego, is shown asymmetrically within an extraordinary polygon. Interesting.

Figure 32 is similar, in a way, to 30. The months which oppose the hands of a watch are of varying lengths.



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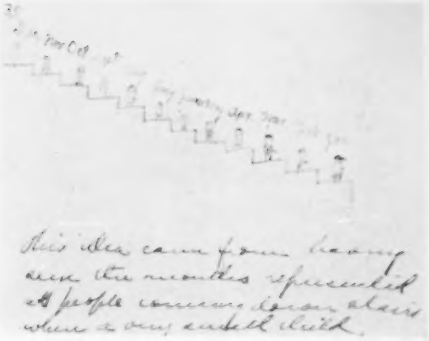

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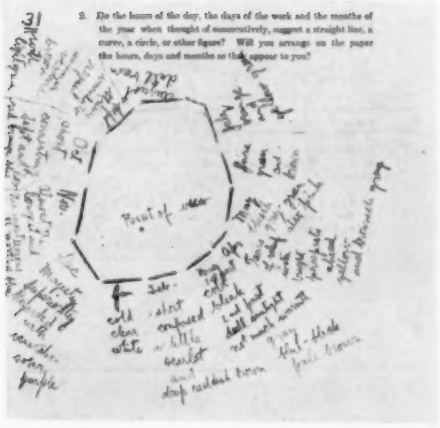
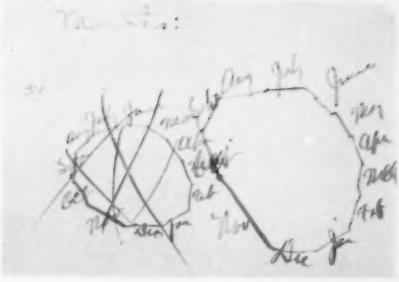
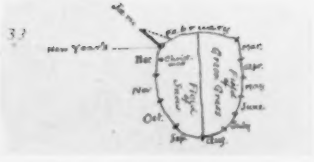

2. Do the hours of the day, the days of the week and the months of the year when thought of consecutively, suggest a straight line, a curve, a circle, or other figure? Will you arrange on the paper the hours, days and months as they appear to you?
Point of view

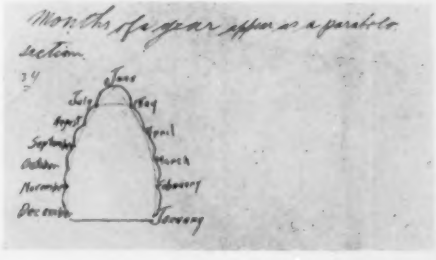
31



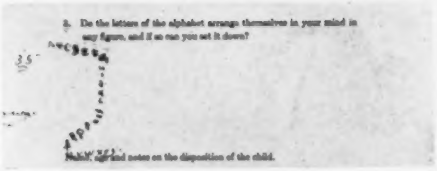
32



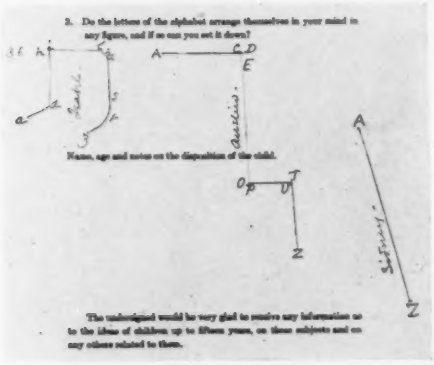
33



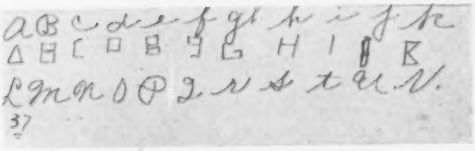
34


3. Do the letters of the alphabet arrange themselves in your mind in any figure, and if so can you set it down?
Name, age and notes on the disposition of the child.

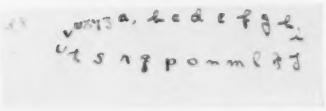
35


3. Do the letters of the alphabet arrange themselves in your mind in any figure, and if so can you set it down?
Name, age and notes on the disposition of the child.
The undersigned would be very glad to receive any information as to the ideas of children up to fifteen years, on these subjects and on any others related to them.

36



37



38

Figure 33, shield-shaped, with January stuck on at the northwest and its color values, is quite different from the others.

Figure 34, partly a parabola, resembles figure 13 in its scalloped edges.

Alphabet forms are not so striking as the others. Figure 35 shows the letters in lines that turn at unusual obtuse and acute angles.

Figure 36 seems to have no reason for its existence; it may be described as a freak.

Figure 37 looks like a child's semi-joke like play-words which have an assonance with the real.

Figure 38 is a rare form, more or less elliptical with the spacing of the individual letters very irregular.

In general, these examples will show the character and the variety of the true "forms"; many are and will be published, but there will be few duplicates.

PEABODY MUSEUM, HARVARD UNIVERSITY
CAMBRIDGE, MASSACHUSETTS

BOOK REVIEWS

Essays and Studies Presented to William Ridgeway . . . , Disney Professor of Archaeology and Brereton Reader in Classics in the University of Cambridge, Fellow of Gonville and Caius College, on his Sixtieth Birthday, 6 August 1913. Edited by E. C. Quiggin, M. A., PH.D., Fellow of Gonville and Caius College. Cambridge: University Press, 1913. Pp. xxv, 656.

Among the pleasant customs which come to us out of the German land is that of commemorating the professor's "feast day," when the loving pupils and admiring friends of some venerated teacher gather with him around a generous table on his natal anniversary, to listen, between courses, to toasts and poetic eulogies in honor of the occasion, and at the close to lay at the feet of the master, each one a chip from his own special research workshop as a contribution to a memorial volume to be published later. Among the most recent and interesting of these is the volume now under consideration.

Professor William Ridgeway was born in Kings county, Ireland, in 1853; educated there and at Trinity College, Dublin, and later at Cambridge; became Professor of Greek in Queen's College, Cork, in 1883, and Professor of Archaeology at Cambridge in 1892, which position he still occupies; besides having filled for various periods the office of University lecturer on Natural Religion, Art, and Irish Archaeology, and served as President of the Royal Anthropological Institute, and of the Anthropological section of the British Association, as well as of four different Cambridge University societies. His numerous published works are of corresponding variety.

The volume comprises fifty papers by as many authors, whose names might serve as the honor roll for anthropology and classical research in Great Britain and Ireland. A fine portrait of Professor Ridgeway faces the title-page, and a very full index at the close facilitates reference. An initial poem by Professor Godley of Oxford, a compatriot of Ridgeway's, is a delicious bit of satire on the vanity of passing theories and equal to our own Autocrat at his best. We forbear to mutilate it by quoting a fragment, as it must be read entire to get the full flavor. Professor Harrower of Aberdeen follows with a eulogy in Greek verse.

I

Confess, ye studious! who with eager zest
Read, mark, and learn, and sometimes e'en digest,—
Confess, ye learned, who your hours devote
To scorning Mommsen and neglecting Grote,—
Whate'er the bliss, *origines* to trace,
To guess at Time, and speculate on Place,
Our rude forefathers, with their narrower view,
Were less distracted by the Past than you.
In happy ignorance their days were spent:
They had no inkling what Pelasgians meant:
For them, Greek History spread its simple store,
They knew their Hellas, and they knew no more,—
The blue Aegean in that age of peace
Held nought for them but Histories of Greece:
The mythic hero and the fabled sage
Were still Athenians of a different age,—
Minos was Pericles in embryo,
And Rhadamanthus judged in ὁ ἡ τό.
E'en when Max Müller, celebrated man!
Conceived the Past upon a different plan,
Divulged the fact,—and pleased the world therewith,—
That Agamemnon was a Solar Myth,
And first presented to our mental view
The glorious certainty that nought was true,—
E'en then each legend howsoe'er designed
Was still a figment of the Grecian mind:
No part of dim antiquity but it
Was made, or fancied, by Hellenic wit.

II

Where ancient scholars all unskilled to seek
Knew but the country of the classic Greek,
That world of Hellas now we see at last
A transient phase, a moment in the past:
We view the Grecian in his proper place,
Heir to the legends of some alien race:
With eyes to see, with genius to impart,
Childlike in wonder, half divine in art,
Clothing with random fancies of his own
The mighty relics of an age unknown:
Though but for him the world had ne'er been taught
How Minos ruled and great Achilles fought,

Yet this great Fact transparently appears—
That (save the trifling accident of years)
We to Antiquity are nearer far
Than Hellas was,—at least, Professors are;—
For as to Crete, whate'er's revealed or hid,
Berlin knows more than Athens ever did.

III

Far from the Greek our modern scholars roam:
They trace the shy Pelasgian to his home:
With names of fear the startled world resounds,
Pre-Hittite pots and post-Minoan mounds:
As Homer's heroes in a mist concealed
Deal blow on blow, while darkness veils the field,
So battle still 'mid prehistoric mists
Ethnologists and Archaeologists,
Where shifting vapours show their endless quest
Glimpses of empires, and conceal the rest.
What mighty deeds are perpetrated there!
Programs and Theses hurtle through the air:
Exploded creeds and doctrines newly slain
Rise from the slaughter and contend again:
Unhoped-for data realms unknown create,
And History's course is altered while you wait:
None wins, none loses in that endless fight,
Where none is wrong, since none can e'er be right.

Perchance some digger in a site forgot
Constructs new nations from a Delian pot,—
Not long he triumphs, ere the vast design
Is dashed to dust by one emended line!
What though the student whom such themes attract
Pines for an ounce of undiluted Fact?
Why ask for more? he sees with pleased surprise
Potential vistas hid from earlier eyes,
And knows as much,—be this his comfort still,
Of Fact unquestioned—as his grandsons will.

IV

'Tis well to find what all acknowledge true:
Yet, *that* once stated, what remains to do?
Grant Truth historic by the world received,
Like Euclid proved, like Holy Writ believed,—

Could sages drop their acrimonious pens
To sport like children on each others' dens,
No more each rival's theories destroy,
Accept *one* doctrine for the tale of Troy,—
What then remains, when everyone agrees,
For learned men in Universities?
Dull were the world, intolerably flat:
Yet, Heaven be thanked! there's no great fear of that.
Small fear of that! While wild researchers strive
How 2 + 2 may best amount to 5,
Yet are there those who broadly can survey
The mightiest movements of a distant day;
Who trace those nations to their earliest home
That fought at Ilion and that founded Rome:
Who, while a lance (or head) remains to break,
Seek the large issue, and the nobler stake:
Of tedious pedants though the world be full,
While RIDGEWAY lives, Research can ne'er be dull!

The scientific papers are classified under the subdivisions of "Classics and Ancient Archaeology," "Medieval Literature and History," and "Anthropology and Comparative Religion," each paper being a concise but new and valuable contribution to the subject under discussion. Among those of wider interest under the first categories may be noted—Conway, The Structure of the Sixth Book of the Æneid, an interpretation of the Vergilian concept of the under-world; Gow, Elpis and Pandora in Hesiod, reversing the commonly received theory; Harrison, Sophocles' *Ichneutæ*, in which certain Greek vase designs are interpreted as representations of ancient subterranean dwellings; Moulton, Notes on Iranian Ethnography, embodying some new ideas of Aryan migration; Macalister, The Colophon in the Lindisfarne Gospels, in which he demonstrates the Irish origin of the work and assigns both it and the celebrated Book of Kells to the ninth century: Mawer, The Scandinavian Kingdom of Northumbria, based on a study of place names; Chadwick, Some German River-names, the latest contribution to the disputed question of Keltic versus Teutonic occupancy in ancient Germany; Bergin and Quiggin, two annotated Gaelic Irish historical poems of the fourteenth and thirteenth centuries, respectively.

In the category of anthropology and comparative religion the following papers are of special interest in connection with the problems of prehistoric man in the British islands and the origin and inspiring impulse of the megalithic structures of western Europe, namely, Dawkins,

The Settlement of Britain in the Prehistoric Age; Duckworth, The Problem of the Galley Hill Skeleton, in which he argues against its antiquity; Rivers, The Contact of Peoples; and Smith, The Evolution of the Rock-cut Tomb and the Dolmen, in which the author takes the ground that dolmens and chambered burial mounds wherever found throughout the eastern continent, from the great mound of New Grange even to far Japan, are directly or indirectly traceable to early Egyptian influence. Other notable contributions are Thurston, The Number Seven in Southern India; Joyce, The Weeping God, with some illustrations drawn from primitive America; Frazer, The Serpent and the Tree of Life; Wright, The Mandible of Man from the Morphological and Anthropological Points of View; Myers, The Beginnings of Music.

Professor Tyrrell of Trinity College, Dublin, closes the list with *Versus Eupolidei*, a selection from the Biglow Papers done into Greek.

JAMES MOONEY

Populations Primitives de la Mongolie Orientale. R. Torii et Kimiko Torii. (Journal of the College of Science, Imperial University of Tokyo, March 29, 1914, Vol. XXXVI, art. 4, pp. 1–100, map, 12 plates, 75 figures.)

The authors, M. and Madame Torii, have made several trips to eastern Mongolia and sojourned there for about two and a half years, studying the life, customs and manners, and physical characteristics of the inhabitants of that region from an anthropological point of view. At the same time they engaged in exploration of the numerous archeological remains of the aborigines known by the name of Tong-Hou, now extinct, or at least transformed; to a description of these people the monograph is chiefly devoted.

In a preliminary chapter the authors quote at length the traditions and legends of the Chinese historians and the present inhabitants of Mongolia, as well as the opinions of modern scholars, from Abel Rémusat, the first scientific explorer of that region, to E. Chavannes and J. Deniker, about the aboriginal Tong-Hou. Their own conclusion is that if the Tong-Hou "were not the forefathers of the present inhabitants, they were certainly their great-uncles, that both were of the same race and origin, with the same physical and moral characteristics."

After a survey of the geographical distribution of the many ruins (fortifications, blockhouses) and stations of the ancient Tong-Hou, the archeological finds made in these are described in detail. They consist of stone and bone implements, pottery, iron scoria, bronzes, jewelry, and glass beads. None of these remains go back of the Neolithic stage of

culture, as in fact the whole Far East (China, Japan, Mongolia, Manchuria, and Korea) has so far not yielded any remains of the Paleolithic period. Among the stone implements there are a large number of polished and chipped flint axes; semicircular or lunate-shaped knives with two holes near the dull edge, identical in shape with those found in this country, as well as with the so-called "women's knives" of the Eskimo; "razors," i. e., oblong, slender, sharp flakes and scrapers; perforated round hammers; spear and arrow heads, and perforated stone beads. Of bone and horn artifacts only a few fragments were obtained. On the other hand, the products of the potter yielded a large harvest. The illustrations of examples of pottery decoration fill eight plates, aside from numerous figures in the text. The process of manufacture is described as that of the "Mexicans," that is, by first forming the bottom of the vessel and then building the walls by successive clay coils until the desired height was attained, when the vessel was polished by means of pebbles or with the hand. The authors give also numerous illustrations of the shapes of the vessels and of their handles. With regard to the latter, it may be worth while to mention that the handles of the pottery found on the confines of Laopa-Mouren suggest the form of a bovine horn. A similar specimen can be seen in the National Museum collection of antiquities from Troy. The figures on the decorated pottery are geometrical, consisting of dots, lines, and circles, pressed into the still soft clay either with a point, a mold (*petites raquettes en bois*), or cords and netting. The few bronzes described and illustrated represent the usual specimens, such as spear- and arrow-heads, buckles, etc.

The monograph exhibits considerable familiarity with the European and American literature related to the subject; but the authors preserve their independent judgment based on their investigations and observations. Altogether the paper is a careful, conscientious, and valuable contribution to the anthropology and ethnology of the complex of races and peoples occupying those vast stretches which pass by the name of the "Far East" and which are of steadily growing importance to Americans.

I. M. CASANOWICZ

Lehrbuch der Anthropologie in systematischer Darstellung, mit besonderer Berücksichtigung der anthropologischen Methoden. Für studierende Ärtze und Forschungsreisende. Von RUDOLF MARTIN. Jena: Gustav Fischer, 1914. 8°, pp. xvi, 1181; 460 text figures, 3 plates, 2 charts.

In a science which, like Physical Anthropology, depends on accurate measurements and sytematized observations, progress may be aided very

materially by handbooks which give definitions of terms, regulation of methods, and a summary of the history and of the contemporary knowledge of the branches with which they deal. But such guides should be accurate, comprehensive, impersonal, and impartial; they should also be written in a clear, erudite style, not be entirely dry and still contain nothing superfluous, be amply and yet not excessively nor crudely illustrated, and be provided with a bibliography as well as an index. Also the book should not be unwieldy, that it may be carried conveniently by the field-worker. How far does the work at hand fulfill these requirements?

It is a work on which one of the most competent of anthropologists, with a number of able assistants, have spent many years, though much of the delay in publication was due to the author's ill health. It is also a work which endeavors to deal satisfactorily with an extensive, ramified field and literature, a field in which modern regulation of methods is very recent and still imperfect.

A review of the volume shows that Dr Martin has to a great extent overcome the difficulties in his way and produced a book of much value. For twenty-nine years anthropologists were aided and guided in a large measure by the handbook of Topinard, a monumental work for its time;[1] they will now gravitate toward Martin's *Lehrbuch*, which in many respects might be said to be Topinard brought to date; yet the new cannot and will not wholly supersede the older work, with its charm of text and illustration, and wealth of data.

Students of anthropology will be greatly indebted to Dr Martin for furnishing them with the handbook that bears his name. Nevertheless, the work, even though approached with the kindest feeling, is not felt to be completely satisfactory. It does not wholly meet the expectations, which were probably beyond what could be realized at this advanced and in many respects unsettled stage of our knowledge.

In the first place the book, as was Topinard's, is too bulky, and might have been divided with advantage into two volumes, one dealing with the living man and the other with the skeleton. This would have facilitated the carrying of the needed part on expeditions, leaving the other, of little service in the field, for use in the laboratory.

The illustrations, while excellent in the main, in the photographic reproductions are not always satisfactory as to clearness; and the presence of photographic reproductions of male figures in "the altogether" will probably be found objectionable by some students.

[1] Topinard, P., *Éléments à anthropologie générale*, Paris, 1885, pp. xv, 1157; 229 figs., 5 plates.

In the section devoted to anthropometry of the living, the methods of holding the instruments, as shown in the illustrations, are in some cases awkward and not always precise. In the figures on page 169, showing measurements of the ear, the shaft of the instrument is not applied parallel and transverse, respectively, to the long axis of the ear; the use of the compass in measuring the nose, as shown in figure 47, does not merely indicate a wrong position of the nasion, but the method shown would prevent one from obtaining the measurements in many cases where the septum is descending; the position of the nasion in figure 37 (face view) is higher by three mm. than it is in figure 38 (side view) of the same dimensions; the eye-color tablet on page 193, in black and white only, is of no use except as a possible advertisement; and one looks in vain for illustrations of some of the excellent instruments of French manufacture.

As to the intrinsic value of the text, only a careful perusal of the work can show all the lights and shadows; the lights, however, are evidently and fortunately greatly in excess. It is readily noticeable, nevertheless, that the book is predominantly a German textbook, as it probably was intended to be; that personalities have not been successfully eliminated; that credit is not always given explicitly or where it properly belongs; and that American anthropology has received rather scant attention—a lack which, however, in recent years, is only too common in European publications. The general part of the work, which includes many important subjects, such as historical data, classification of the primates and man, human chronology, etc.; and part B, which deals with more general anthropological matters, are not elaborate enough for the professional anthropologist. In the sections devoted to mathematical analysis and graphic representation one misses an explanatory and critical treatment of these important matters. And in the remainder of the book the working anthropologist will often miss something that would engage his attention and stimulate thought and inquiry.

Notwithstanding the above criticisms, all of which are made in the fairest spirit, Dr Martin's handbook deserves to be recognized as the best modern work of this nature, and it will surely be used extensively. It is hoped that it may reach a second edition and perhaps further editions, thus affording opportunity for improvement; but whatever alterations may be made, it would seem bound to remain somewhat cathedratic and lacking in warmth. The work probably represents the limit of what can be properly accomplished in this line by a single author. The

future handbooks of anthropology must, it seems, be published in a greater number of parts and by the coöperation of a number of competent and thoroughly experienced specialists.

A. HRDLIČKA

Die Insel Nias bei Sumatra. Vol. II. Anthropologische Untersuchungen ueber die Niasser. Von DR J. P. KLEIWEG DE ZWAAN. The Hague: Martinus Nyhoff, 1914. Large 8°, 282 pp., map, 118 illustrations, 8 curves, 26 tables.

Dr Kleiweg de Zwaan, whose work, in Dutch, on the somatology of the Menangkabau Malays I reviewed nearly six years ago in the *American Anthropologist* (N. S., vol. XI, 1909, pp. 289–291), has published recently, in German, a new and valuable contribution to the physical anthropology and ethnology of Nias, an island off the west coast of Sumatra. These data were also collected in the field by Dr de Zwaan himself, with that painstaking care and thoroughness of which his former work on the Malays bears proof.

This volume, dealing with the somatology of the natives of Nias, is the second of the three volumes of which the complete work consists. The first, which appeared in 1913, treats exhaustively of the medicine and medical lore of these islanders; in the forthcoming third and last volume the craniology of the Nias people is dealt with.

It is obvious that a work like this, with its tens of thousands of anthropometric figures, curves, etc., does not lend itself to a brief review. I can only quote very briefly from some of its principal contents and further recommend the study of this bulky volume to all who are interested in the somatology of the Indonesians. It is worth while.

De Zwaan has divided this volume into eighteen chapters, a bibliography, and an index. The sketch map (scale 1: 300,000) of Nias bears the names of the numerous native villages which the traveler visited during his researches.

Before giving the results of his own observations, the author tells us the legends relating to the origin of the Nias islanders and the opinions of different travelers and writers regarding the ethnogeny and physical characteristics of these people. They call themselves Niha, or Ono Niha, i. e., "men" or "children of men."

De Zwaan measured 1298 male islanders, chiefly after the method of Prof. Rudolf Martin. Of every man de Zwaan took more than forty direct measurements, and he also made minute observations on the descriptive characteristics, not to speak of his many notes relating to the physiology and psychology of these islanders. Nearly 13,000 finger-

prints were taken, besides a number of footprints (pp. 71–87; 146–155). The material thus collected represents an enormous mass of positive knowledge, unequaled in the somatology of the Indian archipelago. The only defect, and a serious one, too, is that no women were measured. Probably acting under the suggestion of some timorous and overcircumspect Dutch Government official, for fear of creating trouble, Dr de Zwaan carefully avoided touching any woman. This lack of positive anthropometric material is somewhat compensated by a brief summary of the principal descriptive characteristics of the Nias women (pp. 117–122).

The color of the skin of the male Ono Niha, determined by von Luschan's *scala*, is generally of a clear yellowish brown, often with a slight reddish mixture, especially on the breast. The evanescent blue spots in the skin of the sacral region were found among some young children. The Nias folklore concerning these spots is related (pp. 66–67). The caruncula of the Nias men is partly or almost wholly covered (epicanthus, *Mongolenfalte*) in 791 cases (pp. 105–106). This is further proof, if such were needed, that Kohlbrugge's assertion, according to which the caruncula among all Indonesians is always uncovered, is baseless.[1] Most of the men with a more or less developed *Mongolenfalte* had at the same time oblique eyes.

Real black hair was not found by de Zwaan. A little more than 60 percent of the male natives had black-brown, 32.44 percent brown-black hair. The remainder had ever lighter or grayish hair. The profile of the nose was perfectly straight in 64.89 percent, concave in 12.11, and more or less convex in 16.20 percent. Only 9.40 percent had no prognathism whatever. De Zwaan recognizes two different types among the Nias population—a coarse, thick-set type, and a fine, slim type. The former constitutes the majority. A third, apparently intermediate type, is probably nothing but a juvenile, passing variation of one of the two principal types (p. 116). As de Zwaan visited the interior of Nias, as well as the coast regions, he was able to distinguish some differences in the bodily characteristics of the Ono Niha. Those of southern Nias, for example, are less small, stronger, and healthier than those of the northern part of the island. Certain anthropometrical differences between these two groups were also found. The average height of stature of all the Nias men is 154.73 centimeters. The tallest man measured 171 cm.;

[1] Cf. Dr A. W. Nieuwenhuis, Anthropometrische Untersuchungen bei den Dajak bearbeitet von Dr J. H. F. Kohlbrugge, p. 6 (*Mitt. Niederl. Reichtmuseum fuer Voelkerkunde*, Serie II, No. 5, Haarlem, 1903).

the smallest 135. The average length of the head is 18.10 cm.; the average breadth 14.61; the average cephalic index 80.72: slightly brachycephalic. According to R. Martin's classification 10.5 percent of the Nias population is dolichocephalic; 44.5 mesocephalic; 32.35 brachycephalic, and 12.66 percent hyperbrachycephalic. Dolichocephaly is more frequent among the southern natives. The nose index is distributed as follows: leptorrhinean 13 percent, mesorrhinian 70.13, and chamærrhinian 16.87 percent. The average physiognomical facial index is 76.20, the average morphological facial index 81.74. Given in percentages, 6.95 are chamæprosopic, 88.56 mesoprosopic, and 4.49 leptoprosopic.

During his last journey de Zwaan took not fewer than 131 masks in plaster of living subjects. Of these, 67 are of different natives of the Indian archipelago, and 64 of Nias men. These latter are all reproduced in excellent illustrations, and form a valuable addition to the anthropometrical and other data in which this second volume of *Die Insel Nias bei Sumatra* abounds.

H. TEN KATE

Mexican Archæology. An Introduction to the Archæology of the Mexican and Mayan Civilizations of Pre-Spanish America. By THOMAS A. JOYCE, M. A. London: Philip Lee Walker, 1914. Pp. xvi, 384. (Price 12s. 6d. net.)

Much is to be said in favor of this work. It comprises seven chapters on the ancient Mexicans, and six on the Mayas, with a final chapter summarizing the whole. It shows considerable sense of balance, and familiarity with the literature, even with that part of it produced in America. For a non-American this latter ought to be recognized as something of an achievement. The illustrations in the volume are excellent, taken in part from W. H. Holmes, A. P. Maudslay, and Teobert Maler, but in much larger part from original specimens in the British Museum. The latter are interesting in the extreme, besides being reproduced in first-rate style. It is a pleasure to meet again in a book of this kind the old drawings by Holmes, which are the most illuminating and genuinely satisfying of anything in the field. Mr Joyce's book also includes a fair number of the old-fashioned cuts from Seler, about which the less said the better. On the whole the illustrations are admirable to an unusual degree. Besides the illustrations, the volume contains some addenda in the form of lists of day and month names, a map showing all the important archeological sites in Mexico and Central America, and a dating chart. The whole book is a conscientious effort to present the available facts concerning American antiquity, after due consideration of all the sources.

The dating chart just mentioned will probably be, in the long run, the principal point of attack for critics. This happens in the case of most books which attempt a reconstruction of chronology. Our author has hedged himself about as far as he could with provisos and qualifying statements and sign-boards of various kinds, all to the general effect that his scheme is provisional. The long and the short of it, however, is that he runs history in Middle America back to the year 3643 B. C. Most Americanists would agree that there was a civilization in and around the Central American region at that time. The attempt to make a history concerning the events of this period will probably awaken in many breasts either amusement or a fine scorn. I should say that the principal virtue of this chart, if it has any, is that it presents quite clearly the relation between the Mexican and the Mayan culture. In other words, it presents graphically the information, which is now pretty well substantiated, that there was in a general way a civilization of the Mexican plateau, and another civilization of the more tropical lands to the south, and that the southern civilization was in a general way the older and parent one. The attempt to build chronological history on these facts will, with all the provisos in the world, probably appear to most people as mere mental gymnastics.

Probably the weakest point in this tabulation is the emphasis thrown by the author on the native migration legends of this part of the world. Throughout the book he takes such legendary material almost at its face value. Thus his opening chapter deals with such legendary material, namely the "history" of the Aztecs during their migrations before the founding of Mexico or Tenochtitlan. The author shows inability to grasp the distinction between such migration myths and history properly speaking. Similar migration legends are characteristic of the Pueblo Indians of today. Their story usually starts in the underworld, and the fact that its closing scenes are localized in their present villages does not alter the mythological character of the whole. The portions which deal with the underworld are quite as specific and circumstantial as the parts dealing with later events. Such material as Joyce includes in his first chapter is not Archeology at best, and is not in any sense of the word History until it has been checked by the study of archeological remains. Who has done this for the migrations of the Aztecs? Mr Joyce's emphasis on this kind of thing throws his volume out of focus.

As a matter of fact the whole book should be called Mexican History rather than Mexican Archæology. The bulk of his material, as in his corresponding book on South America, is drawn from distinctly literary sources.

Another feature of the book is Mr Joyce's utterly unregenerate way of referring to the existence of "kings" in Mexico. No fact has been better established than that this notion of monarchy having existed in Mexico is a late and mistaken one. An examination of the early sources, as quoted, for example, by Bandelier, makes it certain that the Spaniards who destroyed the Aztec civilization themselves reported nothing of the kind. Why should Joyce repeat and re-emphasize this time-worn heresy? It is hard not to be impatient with him when he speaks of the Aztec social order as an organized empire with cities built of stone, and rich in gold and gems (page 1); or pictures Montezuma having a personal service on a scale which surpasses even the Arabian nights (page 27). The Spaniards found at Tenochtitlan essentially what Fray Marcos found at Zuñi—a pueblo, democratic to extinction, its principal executive a war chief, surrounded by the inmates of a communal dwelling. The regal state and the more than Oriental splendor vanish into thin air on close examination of the early Spanish accounts. This belief in thrones and principalities finds expression through the whole volume.

The book has certain inadequacies from the literary point of view. In common with several British authors of the present day, Mr Joyce seems not to know a sentence when he sees one. "Nor is this all. A corresponding series of thirteen lords of the day accompanied the day." This makes good sense. In Joyce's book the two independent sentences are run together (page 64). Such defects of style are fairly frequent. In some portions of the work there is a lack of clearness that seems to be due to something more fundamental than mere awkwardness. For example, his chapter on Mexican theology, which is evidently intended to make a rather complicated matter clear, is positively confusing. I think most readers will agree with Mr Joyce in the idea that this portion of the work is over-condensed. Similarly his chapter on the Mexican calendar is not illumining. In other words Mr Joyce's work is in some respects a "rehash" without being an improvement.

Like every author on the Aztecs, Mr Joyce treats of the famous stone monument which goes by the name of the "Aztec Calendar." Also like the other authors, in diagramming and discussing the symbols, he ignores the fact that there are five dots around the central day-sign, not four. A numeral dot, or what seems to be one, is to be found directly under the "sun face," is regularly so represented, but is not, so far as I know, mentioned by any author. Mr Joyce also conforms strictly to type in the matter of the colossal statue with the serpent garments which is the other feature of first interest in the same National Museum of Mexico.

He speaks of the statue, like other authors, as a feminine figure, oblivious of the apparent fact that one side represents a female, the other a male.

I think the general facts about Mr Joyce's book may be summed up and epitomized in the statement that it is the kind of book which has a good index, but no bibliography. In other words, it is carefully prepared, but not altogether adequate. The work by Dr Walter Lehmann ("Methods and Results in Mexican Research," 1907) to which our author refers us for a bibliography, is absolutely and finally inadequate for the purpose. I believe it is quite impossible to find in it reference to the work of such an authority as Teobert Maler, or to any of the results given to science by Harvard University, or to the really fundamental work of Bandelier. This seems to me to be one of the characteristics of Joyce's book throughout; that it is heavy without being exhaustive.

T. T. WATERMAN

The Making of the Roman People. THOMAS LLOYD. London and New York: Longmans, Green & Co., 1914. Pp. vii, 136. (Price $1.50 net.)

It is Mr Lloyd's contention that the Romans, or the patricians among them, were descended from the Gallic invaders who, as tradition has it, sacked Rome about the beginning of the fourth century B. C., and, as Mr Lloyd avers, conquered and settled Latium. In support of his conclusions, the author, after a long introduction, devotes half his book to an endeavor to prove that this hypothesis is not in contradiction with known facts, and the other half to a statement of the philological connection between Gaelic and Latin.

The briefest examination of the negative argument makes it clear that the author has not begun to meet the difficulties which his theory raises—principally, it seems, because he does not know them. As to the second part, it would have been necessary to show clearly that it is the Goidhelic, as distinguished from the Brythonic and Gaulish branches of the Celtic stock, which bears marks of close relationship with Latin. This, however, Mr Lloyd scarcely even attempts to do. The result is that his tabulations prove only what has been well known for generations, viz., that the Celtic and Italic linguistic families are near akin. And even on this point, the material is better and more fully presented in any manual of Celtic or of comparative philology than it is here.

That anyone should propound a theory of racial origins, which appears notably unconvincing to most readers, is not strange. But it is strange that the author has not taken the trouble to acquire easily accessible information on Roman history, comparative philology, and the development

of Latin,—on most matters, in short, which might tend to prove or disprove his thesis, and it excites legitimate surprise that so ill-considered a book should bear the imprint of a reputable publisher.

To quote a single instance: We read (p. 93) that the *patria potestas* of the Romans was universal among all Aryan-speaking peoples. As a matter of fact, it was an institution which the Romans shared with the Celts alone—a circumstance of which the author might have made a great deal.

On page VI of the preface the following statement is made: "Nevertheless I do not venture to hope that the evidence brought forward will be found convincing by many who have attained a certain age." One is almost tempted to say that Mr Lloyd's diffidence is justified.

MAX RADIN

Die Diluviale Vorzeit Deutschlands. I. Archäologischer Teil, von R. R. SCHMIDT; II. Geologischer Teil, von ERNST KOKEN, Die Geologie und Tierwelt der Paläolithischen Kulturstätten Deutschlands; III. Anthropologischer Teil, von A. SCHLIZ, Die Diluvialen Menschenreste Deutschlands. Stuttgart: E. Schweizerbartsche Verlagsbuchhandlung, 1912. Quarto, pp. xiii, 283; 45 plates, 129 text figures.

Beginning with a review of the eolithic problem in which his conclusions are approximately the same as those of Obermaier (see *Current Anthropological Literature*, II, p. 138), Dr Schmidt passes to a study of the paleolithic period in Germany, region by region, a method justified particularly by the fact that the stations fall easily into four groups that are more or less isolated geographically: Swabian-South German, Southwest German, Rhine-Westphalian, and North German. The various stations of each group are described in detail, beginning with the Swabian-South German region where paleolithic stations are the most numerous and stratigraphically most perfect. Of the nineteen stations in this group the reviewer selects Sirgenstein cave as representative; Primitive man lived here intermittently through the Mousterian (two levels), Aurignacian (three levels), Solutréan, and Magdalenian (two levels) epochs. Remains of the bronze and iron ages are also found capping the paleolithic deposits. Nothing earlier than archaic Mousterian has been reported from this part of Germany.

In the Southwest German group, an older industry, the Acheulian, is noted from three stations in valley deposits: Sablon, Achenheim, and Ruederbach. In the Rhine-Westphalian region are likewise a number of loess stations. From a study of these and of Achenheim, Schmidt con-

firms Commont's discoveries in the valley of the Somme, that the industry of the ancient loess is confined to the Acheulian epoch, while the recent loess contains all later paleolithic cultures: Mousterian, Aurignacian, Solutréan, and Magdalenian.

The North German region is remarkable for the complete absence of the later paleolithic epochs: Aurignacian, Solutréan, and Magdalenian. A single station represents the transition from paleolithic to neolithic times. The best known station of this group is Taubach, which is classed as late Acheulian.

Schmidt's studies have done much to fix and clarify the sequence of faunas and culture epochs. The place of the Mousterian culture is at the base of the recent loess; of the two distinct Mousterian levels one is early (primitive) and the other late (La Quina type). Separating the Mousterian from the Aurignacian is a horizon characterized by *Myodes obensis*, a species of lemming. The division of the Aurignacian culture into three phases (early, middle, and late) is exemplified by the cave deposits at Sirgenstein. Stratigraphically and faunistically the Magdalenian is likewise divisible into three sub-epochs. Of these the first belongs to the horizon of the Greenland lemming (*Myodes torquatus*); it is also marked by the persistence of the mammoth, woolly rhinoceros, and cave bear, none of which, however, appears in the succeeding phase. With the middle and upper Magdalenian occurs *Lagomys pusillus*. In the upper Magdalenian the Arctic micro-fauna is superseded by a more or less distinct woodland fauna; the reindeer is left as the only reminder of the earlier Arctic conditions.

Supplementing the part dealing with German finds are instructive chapters on the development of paleolithic culture (and especially of paleolithic art) in western Europe, whence it spread eastward into and beyond Germany.

In Part II, the late Professor Koken writes most instructively concerning the geology and paleontology of the paleolithic stations in Germany (including also a few in Switzerland). He names seven successive faunal stages: (1) Early Quaternary fauna, of a Pliocene type (not yet found in Germany); (2) Early Quaternary fauna with *Elephas antiquus* and remains of certain Pliocene forms (Mosbach, Mauer, Süszenborn); (3) Antiquus fauna, with Pliocene forms (Frankenbach, Steinheim a. Murr, Mauer in part); (4) An early fauna of the mammoth, without *Elephas antiquus* and *Rhinoceros mercki* (Canstadt); (5) Later Antiquus fauna with *Rhinoceros mercki;* likewise mammoth, rarely *Rhinoceros tichorhinus* (Taubach); (6) Later fauna of the mammoth,

Elephas antiquus and *Rhinoceros mercki* rare (Rixdorf, Phoeben), first appearance of Arctic rodents, base of the recent loess, lowest level of cave and rock-shelter deposits; (7) Equus fauna, mammoth and woolly rhinoceros still abundant, reindeer widely distributed, middle portion of recent loess and of cave deposits; (8) Late glacial fauna, horse and reindeer predominating, second appearance of Arctic rodents among which the Greenland lemming is the most abundant, upper part of recent loess and of cave deposits; (9) Post-glacial fauna, reindeer gone from central Europe, stag predominant, horse still plentiful, transition to woodland fauna.

The fourth fauna belongs either to the Riss glacial or to some minor advance of the ice; the fifth to the Riss-Würm interglacial; and the sixth to the Würm or last glacial epoch. The industrial remains from Wildkirchli caves in Switzerland, Professor Koken would place either near the close of the Riss-Würm interglacial or during the Laufen retreat (a warm phase of the Würm glacial).

In Part III by Dr Schliz there is a correlation of fossil human remains from Germany with those of the rest of Europe. The lower jaw of Mauer heads the list in point of age (Piltdown had not yet been reported). The principal Aurignacian races are represented by Brünn, Cro-Magnon, and Grimaldi, with Combe-Capelle as a cross between Brünn and Cro-Magnon.

In the final chapter Dr Schmidt makes use of the results of his explorations in an effort to solve the problem of a chronology for pre-neolithic times. He feels justified in coördinating the Magdalenian culture and its associated Arctic fauna (Greenland lemming) with the Bühl stage. He is likewise convinced that there was a continuity of Arcto-alpine fauna from the Mousterian to the early Magdalenian. In his scheme the Solutréan epoch would coincide with the Achen retreat, the Aurignacian would extend back to the second maximum stage of the Würm glacial epoch, leaving the Mousterian to cover the Laufen retreat, the first maximum advance, and a small part of the Riss-Würm interglacial. This makes a double provision for a Mousterian with relatively warm fauna. Both the Acheulian and Chellean are placed in the Riss-Würm interglacial epoch, and the lower jaw of Heidelberg in the Mindel-Riss interglacial. Schmidt therefore agrees substantially with Obermaier in the correlation of cultural epochs with the various phases of the Ice Age, admitting however that it is still too early to speak with finality concerning the first part of the lower paleolithic period. There is certainly much to be said in favor of putting the primitive Chellean or pre-

Chellean in the Mindel-Riss interglacial epoch as Penck, Commont, and certain others have done.

The work of Dr Schmidt and his two co-authors is admirably illustrated and supplemented by a wealth of references to the literature.

GEORGE GRANT MACCURDY

Ethnozoology of the Tewa Indians. By JUNIUS HENDERSON and JOHN PEABODY HARRINGTON. Bulletin 56, Bureau of American Ethnology. Washington: Government Printing Office, 1913. 76 pp.

In this paper the authors present a careful study of the zoological knowledge of the Tewa branch of the Pueblo Indians of New Mexico. The material is arranged in the form of a check-list of the fauna of the region, based on their own observations and on the records of other competent naturalists. In all cases where identification is certain the Tewa name of each species is given, together with what information could be gleaned as to its habits and range, as well as the native uses and the beliefs connected with it.

The zoological field-work was carried on principally in the Rito de los Frijoles; identifications and ethnological information were acquired at the Pueblo of San Juan. The choice of ground was, in both cases, singularly fortunate. The "Rito," although only a few miles from Santa Fé, one of the oldest Spanish settlements in the United States, lies in a region as nearly unaffected by civilization as can be found in New Mexico. With the exception of a few of the larger mammals, such as the mountain-sheep and the bear, now rare or nearly extinct, the fauna is probably exactly as it has been for centuries, while the physical aspect of the country has not been altered by farming nor by the denudation caused by herds of cattle and sheep. Furthermore the Rito was once occupied by a considerable prehistoric population who were probably racially and certainly culturally the ancestors of the Tewa.

The Indians of San Juan, like the other Pueblos, have also been much less affected by European contact than would appear at first sight. Having been sedentary agriculturists since long before the conquest, their general manner of life and their ways of thinking were very little disturbed by it, and today, in spite of their veneer of European civilization, they are really much closer to their primitive condition than are the great majority of the North American Indians.

The Rio Grande, with its numerous ancient ruins, its wealth of early historical data, and, above all, its present well-preserved native culture, is an ideal field for anthropological research. The value of each piece of

work done on it is cumulative and the present study adequately complements the numerous other investigations which are being carried on in the region by the School of American Archæology, the Bureau of American Ethnology, and the American Museum of Natural History. It is not only a good piece of work, it is, what is unfortunately much rarer, a good piece of work in the right place. The information contained in it can and will be used at once by a number of students.

In the text many interesting points are brought out. It is shown that while the average Indian is more thoroughly conversant with his faunal environment than is the average white man, his knowledge falls far short of that omniscience with which he is usually credited. He knows, for instance, the jackrabbit from the cottontail, but does not distinguish between the several species of each which occur in the region. His classification of animals is based on differences rather than on relationships. This last is only one of many statements which point the way toward interesting lines of investigation. Another relates to the superstition, also current among whites, that the porcupine, when angry, can "shoot" his quills. Are there other such common beliefs?

What we need in the present state of our investigations in the Southwest is data rather than conclusions, and of the former we are supplied by "Tewa Ethnozoology" in generous measure. The partnership of trained ethnologist and trained zoologist is a singularly happy one, and it is to be hoped that they may continue their investigations, not only among the Pueblos but also among some one of the nomadic tribes of the region, the Navaho, Apache, or Ute. As the authors suggest, such tribes are more dependent on their animal environment than are the agricultural Pueblos, and their knowledge might differ both in quantity and in kind.

A. V. KIDDER

Die altthüringischen Funde von Weimar (5-7 Jahrhundert nach Chr.). Von A. GÖTZE. Berlin: Verlegt bei Ernst Wasmuth A.-G., 1912. Quarto, 72 pp., 18 heliotype plates, 1 colored plate, etc.

In this work of historico-archeological character, Dr Götze makes splendid use of the antiquities in the City Museum at Weimar, that had been found at various times since 1886 in an ancient cemetery within the limits of the present city of Weimar, as well as of specimens from other parts of Weimar and its immediate environs. About half the specimens from this old cemetery are in the Royal Museum of Ethnology, Berlin; these will form the basis for another work.

The graves were particularly rich in arms, ornaments, and articles

of household use. The mode of burial was the one dominant during the period in question. In a single instance the coffin was partially preserved and showed that use was made of a tree trunk. The disposal of the grave objects with reference to the skeleton was often such as to throw light on the manner in which these objects were used.

Curiously enough the conquest of Thüringen by the Franks in 531 left no record of itself in this old cemetery which was in use about 100 years before and 100 years after the conquest.

Of special interest are certain inscriptions. On a silver spoon *in Niello* is the word *Basenae*, the name of a Thüringian queen of the fifth century who later became the wife of the Frankish King, Childerich I, and mother of Chlodwich I. Dr Götze was able to decipher a number of runic inscriptions on ornaments, as well as to confirm archeologically historical traditions concerning the relations between the Thüringian royal family and the Ostrogothic King Theodorich. He concludes that Weimar was in all probability the seat of Queen Amalaberga, a niece of Theodorich the Great, and therefore also the residence of the last Thüringian King Hermanfried.

GEORGE GRANT MACCURDY

Kinship and Social Organisation. By W. H. R. RIVERS. London: Constable and Co., Ltd., 1914. (Studies in Economic and Political Science, No. 36.) Pp. vii, 96. (*2s. 6d.*)

This little book, containing three lectures recently delivered at the London School of Economics and Political Science, should make a special appeal to American students. Dr Rivers here seeks to lift the so-called classificatory system of relationship, discovered by Lewis H. Morgan, out of the discredit into which it has fallen at the hands of critics, of whom Professor A. L. Kroeber of the University of California is mentioned as the most radical and uncompromising. The work, in consequence, bears a polemic stamp and sets forth in strong contrast the fundamental differences as respects *method*, which today divide anthropologists into warring schools.

In a thoughtful article published five years ago in the *Journal of the Royal Anthropological Institute* (vol. XXXIX), Professor Kroeber took the ground that the distinction between classificatory and descriptive systems, as ordinarily stated, is entirely fallacious, since every language—high as well as low—"groups together under single designations many distinct degrees and kinds of relationship" (p. 77). The total number of different relationships which can be distinguished is very large, running up into the hundreds; to enumerate and classify those of different

languages is an idle task; "let us endeavor rather," declared Professor Kroeber, "to discover the principles or categories of thought underlying all terms of relationship." He himself recognized eight categories; one, the difference between persons of the same and of separate generations, another, the difference between lineal and collateral relationship, a third, the difference of age within one generation; and so on. Some languages, such as English, give expression to four categories only; all the Indian languages, on the other hand, express from six to eight categories. According to Professor Kroeber the only scientific way of distinguishing the languages of Europeans from those of less civilized peoples, as respects the method of denoting relationship, is by means of these categories. The conclusion was drawn that terms of relationship, being the results of psychological processes only, afford no evidence as to social organization and marriage. They reflect, not sociology, but psychology. "Whenever it is desired to regard terms of relationship as due to sociological causes and as indicative of social conditions, the burden of proof must be entirely with the propounder of such views" (p. 83). This burden Dr Rivers now assumes.

In shaping his psychological interpretation of terms of relationship Professor Kroeber confined himself to the American evidence. Dr Rivers, in turn, relies chiefly upon the data gathered by him in Melanesia and Polynesia for support of the theory that the origin of the terminology of relationship must be sought in social conditions. Some reference is made, indeed, to South India and North America, but only in the way of additional illustration. By thus limiting his study to matters on which he is a first-hand authority, the author has been able to present his arguments in the clearest and most convincing form.

What, then, in the opinion of the reviewer, has Dr Rivers proved?

First, that in Melanesia and Polynesia definite evidence exists for the association of classificatory terms of relationship with special social functions. Here the presence or absence of these terms seems to be, in fact, largely dependent on whether there are or are not such definite social functions (pp. 14 ff.).

Second, that in Melanesia and Polynesia many details of classificatory systems have been directly determined by social factors, and cannot be explained by psychological similarity. Particular instances are: 1, cross-cousin marriage in Fiji, the New Hebrides, and Guadalcanar, where the systems of relationship are just such, and only such, as would follow from this form of marriage (pp. 22 ff.); 2, the pecularities of the Banks islands systems of relationship, which are found to be the outcome of a social

regulation requiring the marriage of persons who belong to different generations (pp. 28 ff.); and, 3, the exceptional features observed in the island of Pentecost, where, also, these can be accounted for as the result of particular social regulations (pp. 31 ff.).

Third, that in Melanesia and Polynesia certain features of the nomenclature of relationship enable us to establish the existence of forms of marriage in the past, for which no direct evidence is now obtainable. The particular instances cited by Dr Rivers occur in Fiji (pp. 39 ff.), possibly in Torres straits (p. 44), the Solomons (pp. 45 ff.), and the Trobriand islands (pp. 55 ff.).

Fourth, that in Melanesia and Polynesia certain varieties of the classificatory system are to be referred to the different degrees in which the regulation of marriage by clan-exogamy has been replaced by kinship or genealogical relationship (pp. 60 ff.).

For our purpose it is unnecessary to follow Dr Rivers further. Passing reference may be made to his argument that the main features of the classificatory system, not only in Oceania, but also in Australia, India, Africa, and America, are correlated with a social structure having an exogamous group, the "clan," as its essential unit. He suggests, also, that this system, when found, may point back to an earlier state of organized sexual communism (not "promiscuity"). His book concludes with some interesting remarks concerning the proper place of psychological explanation in sociology.

> It is incumbent on those who believe in the importance of the psychological similarity of social phenomena to show in what the supposed similarity consists and how it has come about—in other words, how it has been determined. It has been my chief object in these lectures to show that, in so far as such similarities exist in the case of relationship, they have been determined by social conditions. Only by attention to this aim throughout the whole field of social phenomena can we hope to rid sociology of the reproach, so often heard, that it is not a science; only thus can we refute those who go still further and claim that it can never be a science (p. 94).

HUTTON WEBSTER

Südsee-Urwald Kannibalen. Reise-Eindrücke aus den Neuen Hebriden. Von FELIX SPEISER. Mit 192 Abbildungen und 2 Karten. Leipzig: R. Voigtländers Verlag, 1913. Pp. v, 307.

This is a charmingly written account of Dr Speiser's travels in the New Hebrides, Santa Cruz, and Banks islands, which in spite of its popular guise embodies noteworthy contributions to our knowledge of Melanesia.

Of considerable interest, especially in view of recent work in New Guinea, is the author's discovery of a pygmy race in western Espiritu Santo (p. 131 et seq.). To be sure, his find was never in an unadulterated form: in no locality did more than 70 percent of the population represent the pygmy type, and externally they do not differ markedly from neighboring peoples except in point of stature, which averages 152 cm. for the men and 144 cm. for the women. In skin color, however, the pygmies are lighter than the Melanesians, and there is a relatively slight development of the beard. Culturally, Dr Speiser's pygmies display a number of distinctive traits. They cultivate the soil and even practise irrigation, depending, however, rather on taro than on yams. There is no deformation of the body, except for the occasional perforation of the ear-lobe. The arrows, unlike those of the Melanesians, are feathered—a feature very rare in Oceania. In the social life the lack of the sharp separation of the sexes that is so prominent in the home of the *suqe* is noteworthy.

Of the last-mentioned institution Dr Speiser gives an excellent account (p. 65 et seq.), corroborating and supplementing Codrington's description and the data recently published by Miss Sebbelov (*American Anthropologist*, 1913, pp. 273–280). The dual nature of the *suqe*, its social and religious side, is clearly brought out. It is defined briefly as a union of all men who have sacrificed pigs; membership in it is the sole means of securing social distinction and other-worldly happiness. While the fundamental character of the *suqe* remains constant throughout its area of distribution, the number of grades varies from island to island. Thus Codrington ascribes but four ranks to the club in Leper's island (Aoba), but no fewer than a dozen to the organization of Pentecost, where indeed one of the twelve is subdivided into three steps. Miss Sebbelov describes six castes for East Malekula, three of them subdivided into ten or more grades. Dr Speiser finds fourteen castes in Ambrym, twenty in Venua Lava, and (in contradiction to Codrington) ten in Aoba. I am under the impression that the castes themselves are devoid of content; that is, we have not, as among some of the Plains Indians, organizations with distinctive features that are arranged in a series, and each of which might just as well, and often does, exist independently of the others. In the *suqe* the basic notion seems to be that social advancement is a matter of sacrificed tusk-pigs, and the difference in the number of sacrifices is objectively represented by distinct fireplaces in the men's club-house, without any one caste being characterized by a form of activity independent of its rank. From this point of view, the indefinite development of grades

in different localities seems not only intelligible but perfectly natural. Other local differences are pointed out by Dr Speiser. In Aoba, for example, men and women are not so sharply separated as elsewhere, and the men's house becomes a bachelors' sleeping-hall, not closed to the women during the day (p. 237). In Tanna the men's club is lacking completely, and the place of the aristocracy represented by the higher castes is taken by hereditary chiefs,—this being one of a number of Polynesian features noted by the author (p. 275). Again, Ambrym has an unusual development of the *suqe*, the divided club-house common to all the castes being superseded by distinct houses for the upper castes, each distinguished by the character of its enclosure; the lower castes have wooden fences, while the higher ones are screened with coral slabs of varying height. In addition to the *suqe* the natives of this island had a number of obsolescent secret organizations (p. 186). The caste of a person is also represented in Ambrym by the number of heads carved on his upright tomtoms, or in South Malekula by the number of heads on his posts (p. 187, pl. 60).

Material culture naturally receives considerable attention. Dr Speiser notes briefly the occurrence of the loom in Santa Cruz and its absence elsewhere (p. 294). Oddly enough, he does not, like Codrington (*The Melanesians*, pp. 20, 316), refer to the existence of similar looms in the Caroline islands, the Philippines, and Borneo, but writes, in a fit of Graebneritis: "Es findet sich hier das Instrument in seiner einfachsten Form, in der es bis nach Amerika gewandert ist" (p. 294). This, however, is perhaps the author's sole defection from a sane application of the historical method throughout the book. Speiser's remarks on pottery (pp. 148–149, pl. 40) are very suggestive. The industry is practised exclusively in two villages of the Cape Cumberland peninsula, in northwestern Espiritu Santu. Strangely enough, the methods employed differ fundamentally in these localities: in Wus the potter models her vessel with the sole aid of a small flat bamboo splint, while in Pespia she builds it up of coils resting on a short bamboo cylinder held between her thighs. In the chapter on Malekula, the description of head-deformation and of the construction of skull-masks, as well as of ancestral effigies (pp. 206–208, pls. 59, 61), is of the highest interest.

Sociology, of course, could not be adequately treated in a popular work. It is to be hoped that in the fuller treatise certain apparent contradictions with the statements of other writers will be explained, or at least specifically dealt with. For example, Codrington has stated (op. cit., p. 24) that in neither the Banks islands nor the New Hebrides

do the moieties bear any name or have any distinctive badge. But, according to Speiser's informants, whose data were amplified by a missionary, the exogamous moieties of southern Pentecost bear names and believe in their descent from the turtle and the taro respectively (p. 215). Another matter of still greater importance should be brought to the author's attention. According to Dr Rivers (*Kinship and Social Organisation*, pp. 34–37), marriage with a brother's granddaughter was the normal thing in Pentecost, while Dr Speiser informs us that a system grafted on the exogamous dual organization prohibits marriage between members of different generations (p. 215).

Many exceedingly suggestive historical connections are pointed out between the several islands of the New Hebrides and with other groups visited. Thus, the author refers to the distribution of tree-fern statues in Ambrym and the Banks islands, and their relative paucity in Malekula (p. 187). It is interesting to note that many Ambrymese ceremonies were adopted from southern Malekula only in quite recent times and that the process of diffusion resembles that ascertained in a number of cases in North America. There are Ambrymese men who spend months in Malekula in order to be initiated into the arcana of some of these alien cults; ceremonial songs and dances are regarded as a form of property; and the privilege to use them must be purchased at a high price (p. 186).

The maps at the end of the volume are rather inadequate, but the illustrations are numerous and excellent. Ethnologists will look forward expectantly to the monograph that is to follow Dr Speiser's preliminary report.

ROBERT H. LOWIE

The Code of Handsome Lake, the Seneca Prophet. By ARTHUR C. PARKER. (New York State Education Department, Bulletin 530, Albany, 1913.)

In this paper Mr Parker has given us a translation of one of the most remarkable documents of modern Indian religious propaganda. Handsome Lake, the Seneca prophet, was born in 1735 in western New York. He was an invalid, and, in addition, a sot during most of his life, but, in consequence of a trance, during which he believed that he had received supernatural revelation, he reformed and began to promulgate a new faith based on his vision, prophesying and preaching morality, temperance, and cessation of such of the old-time customs as seemed to him to savor of necromancy.

The Code has been preserved by being handed down by word of mouth for four generations, and has doubtless become somewhat modified in the process. However, some fifty years ago, the priests then living

held a convention at which, after a discussion, the form was standardized and written out by an educated member. The present priest at Cattaraugus, N. Y., Edward Cornplanter, who himself was responsible for the loss of this document, recently commenced to rewrite the Code from memory, and was persuaded by Mr Parker not only to carry the work to completion, but to allow a translation of it to be published.

The Code is a truly remarkable admixture of the old religion and philosophy of the Iroquois with the teachings of the Christian missionaries. Under the constant pressure of representatives of various European religious sects, since the time of the Jesuits, the "pagan" Iroquois naturally have absorbed, willy nilly, a certain amount of our ethics and biblical teachings, which here are very apparent.

The Code commences with an historical introduction relating the prevalence of drunkenness and concomitant vices among the Iroquois. It continues, describing Handsome Lake in his illness, calling upon the old gods, singing, and vacillating between temperance and inebriety. It chronicles his apparent death, and his vision, in which he meets four beings who undertake to instruct him, after which he revives and takes up his duties as prophet and priest.

The actual Code, known as the great Message, consists of no fewer than one hundred and thirty sections, of which the earlier ones recount the besetting sins of the Iroquois and warn the people to repent and cease committing them. These include drunkenness, witchcraft, charm-making, abortion, divorce, jealousy, vanity, harlotry, and other vices. It also attacks all ceremonies connected with the totem animals, possibly because of their connection, real or supposed, with witchcraft, although the prophet's reason for assailing them is not obvious. On the other hand, the Code upholds certain other old ceremonies and festivals which are directed rather to the worship of the gods above, particularly the burning of the white dog. It also endorses the ancient custom of giving tobacco sacrifices. Some miracles performed by the prophet are chronicled, and then a prophecy as to the approaching end of the world, and the manner of its destruction.

Now comes in many respects the most remarkable portion of the Code, the description of the journey of the prophet to the Hereafter, and his experiences. Like Dante, he met various damned souls undergoing torments appropriate to their crimes. On the way he meets various personifications of evil and sees allegorical tableaux. He also sees George Washington occupying a place of honor near Elysium. The Iroquois have always been grateful to the memory of Washington for

championing their cause and permitting them to retain their homes at the close of the Revolution, although several of the tribes had been hostile. After the description of the prophet's journey through hell we follow him in like manner through heaven, visiting the good souls, after which, with a short historical account of the death of Handsome Lake at Onondaga, the Code proper closes.

One point which Mr Parker does not mention is this: Almost since our first contact with the Indians of North America there has been a constant succession of Messianic or revealed religious outcropping sporadically among all the tribes south of the Canadian line. That of Tenskwatawa and Handsome Lake in the East, and the Dream Dance, Ghost Dance, and Peyote, in the west, being perhaps the best known. In almost every one of these the half-digested teachings of the missionary have been apparent. The white man's theory of morality and justice, if rarely seen in practice, was highly appreciated by the Indian, and the idea of a revealed religion was nothing new to him.

Nevertheless, of all these cults, the two to make the most lasting, if not the most profound, impression, were the Peyote (miscalled "Mescal") and the Code of Handsome Lake. Both aim at the suppression of drunkenness particularly, both seem to uphold some ancient practices and to condemn others. The Peyote religion differs from the Code of Handsome Lake strongly in many ways, particularly in that it offers, in the peyote "button," a substitute for liquor, which, it is said, successfully kills the desire for alcohol. The Peyote teachings have been far more prosperous and popular than the Code of Handsome Lake, having spread like wild-fire over many of the tribes of the West, and are now working eastward and northward, while that of Handsome Lake has always been confined to the Iroquois. Peyote is, however, still a comparatively young religion.

Between the teachings of Handsome Lake and his renowned contemporary, Tenskwatawa, the Shawnee Prophet, the twin brother and coadjutor of Tecumseh, there is some resemblance. Says Drake in his *Life of Tecumseh:*

> He declared that he had been taken up to the spirit world and had been permitted to lift the veil of the past and future—had seen the misery of evil doers and learned the happiness that awaited those who followed the precepts of the Indian god. He then began an earnest exhortation, denouncing the witchcraft practices and medicine juggleries of the tribe, and solemnly warning his hearers that none who had part in such things would ever taste future happiness. The fire-water of the whites was poison and accursed; and those who

continued its use would be tormented after death with all the pains of fire, while flames would continually issue from their mouths. . . . The young man must cherish and respect the aged and infirm, all property must be in common, according to the ancient law of their ancestors. Indian women must cease to intermarry with white men; the two races were distinct and must remain so. The white man's dress, with his flint and steel, must be discarded for the old-time buckskin and the firestick. More than this, every tool and every custom derived from the whites must be put away, and the Indians must return to the methods the Master of Life had taught them. When they should do all this, he promised that they would again be taken into the divine favor, and find the happiness which their fathers had known before the coming of the whites. Finally in proof of his divine mission, he announced that he had received power to cure all diseases and to arrest the hand of death in sickness or on the battle field.

If the similarities of the two schools are obvious, no less so are the divergencies. The code of Tenskwatawa is warlike: he breathes hatred and war against the whites, and return to the old customs. He does not hesitate to promise immunity to the warrior who goes to war against the paleface, resembling the Ghost Dance teachings in some of their phases.

Although conceived in the same atmosphere of hatred, distrust, and despair engendered by aggressions of the whites during the close of the eighteenth and the opening of the nineteenth centuries, and uttered by a scion of one of America's most martial tribes, the Code of Handsome Lake is conceived in a spirit of peace. He advocates rather than deprecates the adoption of what is good in a European way, since he sees that by that method alone is salvation possible for his people. He strives to lead his youths away from war; he refers to utterances by the revealers of his faith against strife. The Code is preëminently one of submission to the inevitable, and it is remarkable that it was endorsed by some of those same white officials of high authority who ordered the troops to advance against Tecumseh and Tenskwatawa.

It seems improbable that Handsome Lake was not influenced by the Shawnee Prophet. The latter was already in the field when Handsome Lake commenced his work, and as it is known that Seneca youths had broken away from the tribe to join the followers of Tecumseh, it would be strange if some of the Shawnee doctrines had not reached the ears of Handsome Lake.

At all events, Handsome Lake was a man of no inconsiderable ability and character, and, as Mr Parker shows, his teachings have contributed more than any other factor to the relatively high moral standard of the Iroquois and the solidarity of their pagan party as it is today.

The second part of Mr Parker's work is concerned with "Field Notes on the Rites and Ceremonies of the Ganio'dai'io' Religion."

From the title one is led to assume that the ceremonies recorded are a part of the doctrine and teachings of Handsome Lake, but as a matter of fact they seem rather to be those already existing ceremonies which he approved and to which he gave additional impetus. They include remarks upon the New Year's, White Dog, Ne Ganeoweo, Corn Planting, Maple Thanksgiving, and the Legend of the Coming of Death, with funeral addresses.

Mr Parker also includes sketches of the secret societies, several of which Handsome Lake tabooed but which have persisted secretly until the present day, and a few Iroquois myths. The rituals of several of the ceremonies, etc., are given, together with some texts, not all of which are translated. The material is interesting and valuable, especially as we have so little information on the Iroquois.

No one who has not attempted to gather material similar to the Code can realize the difficulty of the undertaking, for it is such lore as this that the Indian, and particularly the conservative Iroquois, guards as sacred. Only an intimate knowledge of the people, combined with tact and genuine sympathy for their viewpoint, can bring it out. It is not to be bought for money alone.

All in all the work is excellently and painstakingly done, but the reader may feel disappointed that Mr Parker has given us none of his own conclusions on the subjects which he has presented, since, from his intimate knowledge of the Iroquois, and particularly of the Seneca, he is well qualified to do so. The writer, however, through his personal acquaintance with Mr Parker, realizes the many difficulties which surrounded and hampered the publication of this paper, and hopes that at some not distant date the author will be able to give to the public not only more of his great mass of material but more of the results of his own study of the subject.

ALANSON SKINNER

The Peoples of India. By J. D. ANDERSON, Teacher of Bengali in the University of Cambridge, formerly of the Indian Civil Service. Cambridge: University Press. (New York: G. P. Putnam's Sons.) 1913.

This little book, for the greater part a compilation of the works of Grierson, Risley, Crooke, et al., is the worthy attempt of a retired Indian Civil Service official to introduce the general public to the peoples of present-day India. As such it succeeds fairly well. The professional ethnologist, for whom it is not intended, naturally will turn to the original sources. The chief blemishes are the rather frequent dogmatic assertions for which there is all too little proof (see his remarks on the Atharva-veda,

p. 87, for example). A reference to the more recent discussions of exogamy and totemism would be acceptable on page 35.

TRUMAN MICHELSON

A Study of North Appalachian Indian Pottery. By CHRISTOPHER WREN. Plymouth, Pa., 1914.

Mr Christopher Wren has long been known to archeologists as the prime authority on the archeology of the Wyoming valley and adjacent Pennsylvania, through his papers, published mainly in the *Proceedings of the Wyoming Historical and Geological Society;* but this is the most pretentious effort yet received from his pen.

The volume opens with a brief review of the history of earthenware and pioneer potters, containing much that must prove suggestive to the student of American Indian pottery manufacture. From this point Mr Wren takes up the earthenware of the region, pointing out the interesting fact that most of the vessels now known were found in rock or cave shelters, although a few were obtained from graves. This is interesting because in the rock shelters of the lower Hudson in New York, as well as in New Jersey and Connecticut, no whole vessels have as yet been found, although fragments are abundant. The pottery was undoubtedly largely made in the general region; a number of pottery kilns are reported. These are so unusual here in the East that we may be permitted to quote Mr Wren in full on this point.

> Near the extremity of Tioga Point, where the Chemung river forms a junction with the Susquehanna, close to the edge of the water, on the Susquehanna side, he[1] saw a number of years ago, a stratum of light colored clay of fine quality.
>
> On the top of the bank were two circular platforms, about four feet in diameter, paved with stones and slightly depressed in the centre. These platforms showed marks of considerable use, he thought, as the places where the clays were mixed and tempered to fit them for use in pottery making. Built into the bank, adjacent to these platforms, were four steps laid up in stone, which gave evidence of having been much subject to the action of heat. These steps he took to be the shelves on which finished vessels were set up when undergoing the process of firing.
>
> In the immediate vicinity was a great quantity of broken pottery, which was probably the fragments of pottery that had been broken in the burning.

Mr Wren takes up and treats the materials and form of the local vessels, giving a diagram on which is shown the application of the various terms used. This is an excellent and useful idea. Mr Wren's theory

[1] Mr Wren's informant, Mr M. P. Murray, of Athens, Pa.

that some of the shapes of some of the heavy flaring collars found on Iroquoian ware were derived from the profile of the bark canoe, seems very far-fetched to the writer, and his drawing to illustrate the point shows a canoe that could not be put to any practical use. *Per contra*, from its depth and shortness the shape of the canoe would seem rather to have been suggested by the profile of a pot collar.

Mr Wren's further remarks on the general characteristics of the vessels are good, but it is to be hoped that he will give us a more detailed study of form and decoration later. Mr Wren might well find suggestive information on this line in Volume III of the *Anthropological Papers of the American Museum of Natural History*, in which the pottery of the Algonkian Indians of coastal New York receives notice at some length.

The rest of the work is devoted to admirable illustrations and descriptions of the individual vessels. It is interesting to note that so many whole kettles have come from this one region. Three other fine vessels, of whose existence Mr Wren is perhaps not aware, are in the possession of the American Museum of Natural History, and were collected many years ago in Pennsylvania. Like those illustrated by Mr Wren, they are of the Iroquoian and Algonkian types. Mr Wren speaks of pointed bottoms as characteristic of the earthenware of the region, yet none shown is so pronouncedly pointed as those of coastal New York and New Jersey.

The clay pipes figured in the volume are in part decidedly Iroquoian, in part as markedly Algonkian. The latter may be attributed to the Lenapé (Delawares), perhaps, while some which conform with neither group may possibly be Shawnee. This brings us to what we are sorry to say may fairly be considered a serious lack in Mr Wren's present volume, but which we hope he will soon remedy in another paper on the subject. He has led us to the very brink of a most interesting bit of research, but has failed to go farther. That is, the linking of the archeological remains at hand with the culture of known historic peoples. The sites in the Wyoming valley are in many cases known to have been occupied in historic times by the Delawares, Shawnee, Nanticoke, Conoy, and various Iroquoian groups. It ought not to be difficult to correlate the pottery from the graves and rock-shelters with the fragments from the old camps.

To go still farther, results of even greater value to the student might be obtained by comparing these remains with those found in the ancient domains of the various emigrant Algonquians. For example, fine collections of Lenapé earthenware from the Delaware valley, the headquarters of the Lenapé tribes, are to be found in the American Museum

of Natural History, the Peabody Museum at Cambridge, and the Field Museum at Chicago.

No one interested in archeology can refrain from thanking Mr Wren for his present and past services, and it is to be hoped that his zeal will lead him to continue his researches and to publish the results for many years to come.

ALANSON SKINNER

The Weathering of Aboriginal Stone Artifacts. No. 1. *A Consideration of the Paleoliths of Kansas.* By N. H. WINCHELL. (Collections of the Minnesota Historical Society, vol. XVI, part 1.) St. Paul, Minn.. 1913. 4°, 19 pl., 20 fig.

The late Professor Winchell believed he had found a sequence of six cultures just south of the Kansas moraine in Kansas. His classification comprises early paleolithic, paleolithic, early neolithic (two stages), and neolithic (two stages). The term "paleolithic" is applied to the culture that antedated the Kansan Glacial epoch. "Early neolithic" covers the period between the Kansan and Wisconsin Glacial epochs, and "neolithic" applies to post-Wisconsin culture. This classification is based on the form and patination of the artifacts.

GEORGE GRANT MACCURDY

DISCUSSION AND CORRESPONDENCE

Algonkin Languages of California: A Reply

In a paper on "Wiyot and Yurok, Algonkin Languages of California," published in this journal (N. S., vol. 15, 1913, pp. 617–46), I ventured, on the basis of lexical, morphological, and phonological evidence, to demonstrate that Wiyot and Yurok were very divergent outlying members of the great Algonkin linguistic stock. No one is more keenly alive than myself to the probability that not a few of the lexical and morphological elements compared in this article may, on maturer knowledge, turn out to be untenable parallels, but it seemed and still seems to me that the general cumulative evidence presented is so strong and that many of the specific elements compared are so startlingly similar that no reasonable doubt could be entertained of the validity of the claim. However, Dr Michelson is evidently far from convinced, for in a note entitled "Two Alleged Algonquian Languages of California," also published in this journal (N. S., vol. 16, 1914, pp. 361–67), he adopts a severely critical attitude and tries to show, apparently to his entire satisfaction, that Wiyot and Yurok are not and can not (we might almost add must not) be Algonkin. Five main reasons are given for his dissent, followed by a list of seventeen specific respects in which Wiyot differs from Algonkin, and of eight in which Yurok so differs. Considerable space is then taken up with the attempt to prove that five or six morphological elements have been wrongly compared (leaving the reader to conclude, I presume, that all other comparisons of elements suffer from the same defect), after which some rather random data are given to show that accidental linguistic resemblances crop up in all sorts of places.

Dr Michelson triumphantly ends: "Enough has been said to show the utter folly of haphazard comparisons unless we have a thorough knowledge of the morphological structure of the languages concerned. It is for this reason that I have refrained from endeavoring to compile a list of fancied lexicographical resemblances between Wiyot and Yurok with other languages than Algonquian ones, and a list of such similarities between Algonquian and other languages than Wiyot and Yurok." It is difficult for one convicted of "utter folly" to gain a hearing in

self-defence, for he is to be trusted no further. And yet I shall try to rescue at least part of the painfully constructed edifice that Dr Michelson has sent tottering over my head and to show that the trouble with Wiyot and Yurok, like the premature report of Mark Twain's death, is "greatly exaggerated." As for Dr Michelson's self-denial exhibited in the passage quoted, it can but elicit our admiration, the more so as he has in this way escaped from what would no doubt have proved an onerous task. Still I somewhat regret that Dr Michelson did "refrain," for as goodly an array of say Fox-Chinese parallels of equal inherent plausibility and consistency as those I have given for Algonkin and Wiyot-Yurok would have done more to convince me, for one, of the absurdity of my thesis than anything else in his reply.

Among the five main "reasons" for his refusal to follow me in my argument I am concerned to find that Dr Michelson lists: "that fancied [1] lexicographical similarities have little or no weight in view of the above [four] points." It would seem, if I understand Dr Michelson rightly, that my case would have been stronger, if anything, if I had left out most of the approximately two hundred lexical correspondences that I give; at any rate, only four points could then have been scored against me. But what is one to do if the bulk of his evidence is summarily ruled out of court on considerations of a largely irrelevant character? A little later on we are told that "the apparently abundant lexicographical material does not impress" Dr Michelson. All I can say is that if one is not "impressed" by such truly remarkable parallels as Yurok *n-* "my," *q-* "thy," *o-* "his," *m-* "somebody's" (*with body-part nouns*): Algonkin *n-* "my," *k-* "thy," *o-* "his," *m-* "somebody's" (*with body-part nouns*);[2] by Wiyot *m-èpt* "tooth": Cree *m-ipit* "tooth"; Wiyot *māti* "wood": Cree *misti-k*, Cheyenne *mata;* Wiyot *mākw* "grizzly bear": Cree *maskwa* "bear"; Wiyot *mīw-* "to eat (slain animal)": Cheyenne *miv* "to eat (animate object)"; and many others, his individual psychology differs markedly from my own. There is no accounting for tastes,

[1] Would it not have been wiser to leave this word out? It savors of prejudgment, I cannot help thinking.

[2] These four pronominal prefixes must be valued as a unit, instead of being bandied about, as is done by Dr Michelson, torn out of their setting. The evidential value of an *orderly sequence* $a + b + c + d$: $a_1 + b_1 + c_1 + d_1$ is of course vastly greater than of $a : a_1$ or $b : b_1$ singly. Of the logic of cumulative and associated evidence Dr Michelson seems to have hardly an inkling. It is worthy of note that on the most remarkable of these four possessive prefixes, *m-* "somebody's," Dr Michelson is discreetly silent. In general, the really convincing *positive* points raised in my paper are seduously avoided in his reply.

but it seems to me that such callousness deserves to be called linguistic cynicism almost as much as scientific sobriety.

Another one of the five dissenting "reasons" given is: "that many of the supposed similarities in morphological elements must be considered as accidental, for they occur likewise in a number of other languages." The "for" of this statement seems to me to involve a dangerous dogma. Does Dr Michelson seriously maintain that the homology of features $a, b, c, d, \ldots$ of complex A to features $a_1, b_1, c_1, d_1, \ldots$ of complex A_1 is rendered spurious by the fishing up of such further straggling homologies as of a to a_2 of complex A_2, b to b_3 of complex A_3, c to c_4 of complex A_4, and so on? I can see neither logic nor mathematics in his thesis. One might apply it with disastrous results. Thus, the existence of three grammatical genders (masculine, feminine, and neuter) in both Latin and Greek is irrelevant to the question of their genetic relationship, "for" Chinookan also possesses this feature! Further, the presence of a case system in Latin and Greek is of no account in view of the fact that Finnish also possesses one! Or, to make use of a specific morphological element, it is hardly worth while comparing feminine noun-ending *-a* of Latin with *-α* of Greek when we remember that prefixed *a-* occurs as characteristic of feminine nouns in Wishram! Evidently Dr Michelson overreaches himself here. Moreover, at the very best, Dr Michelson's "reason" merely refuses to meet one problem because another incidentally presents itself.

The greatest stress, however, seems to be laid by Dr Michelson on his first "reason": "that the published Wiyot and Yurok material indicates that both have many morphological traits which are thoroughly un-Algonquian." The seventeen articles debarring Wiyot from membership in the Algonkin family are given in support of this statement. Here the two most serious flaws in Dr Michelson's whole standpoint come out glaringly enough. In the first place, his remarks indicate a startling lack of perspective in linguistic comparison; in the second place, he makes an altogether illegitimate use of negative evidence, in a few cases, curiously enough, even turning a positive argument of mine into a negative argument to the contrary.

Taking up the first of these flaws, we must bear in mind that the greater the historic chasm separating languages of common origin, the more profound may be expected to be the divergences that present themselves. We do not expect Swedish and German to show as many and as striking similarities as a Saxon German dialect and a Swabian German dialect; nor German and Latin as many and as striking similarities as

German and Swedish; nor German and Bengali as many and as striking similarities as German and Latin. Turning to America, the parallax of linguistic history absolutely demands that Wiyot and Yurok, granted their relationship to Algonkin, present vastly greater differences from those languages that are generally classed as Algonkin than the extremes of these (say Cheyenne and Micmac) present among themselves. Indeed, from the viewpoint of Wiyot, all the Algonkin languages now recognized as such have not improbably to be considered as a single language exhibiting relatively trivial dialectic divergences, just as the differentiation of Slavic languages today is a quite secondary phenomenon when viewed from the angle of the relationship of say Celtic and Indo-Iranian to Slavic. It is thus obvious that if by Algonkin is meant what Dr Michelson means by it, Wiyot and Yurok *must* "have many traits which are thoroughly un-Algonquian." Russian cannot be more Germanic than it is Indo-germanic; the residue of Slavic minus Germanic, as it were, which is contained in Russian is, of course, as "thoroughly" non-Germanic as you like.

If, now, we turn to Dr Michelson's list of divergences, we are almost thunderstruck by the triviality of many of them; we are even inclined to feel hurt that Dr Michelson should for a moment have wanted Wiyot to be so Fox-like. Thus, we read: "A demonstrative element *ru-* is [in Wiyot] frequently prefixed to verbs, [while there is no such prefix in Algonkin]." One can only shrug his shoulders and ask a puzzled "Well?" Or: "A special particle is [in Wiyot] always attached to the first word of an interrogative sentence, [but not in Algonkin]." This point of difference need not unsettle us, when we remind ourselves that, e.g., while Latin has an enclitic interrogative particle *-ne*, its lineal descendant French has no such thing. Even more instructive as throwing light on Dr Michelson's sense of perspective is this item: "The stem-vowel of a verb is not changed [in Wiyot] to form a participial [as it is in Algonkin]." As a matter of fact, while internal vocalic change of the type referred to is found well developed in, e.g., Cree, Ojibwa, and Fox, it has not, so far as I know, been discovered in such undoubtedly Algonkin languages as Micmac, Natick, Blackfoot, or Cheyenne; in other words, the feature may turn out to be rather a special development of a group of Algonkin languages than characteristic of Algonkin as such. Would Dr Michelson expect Old Irish to resemble a Prakrit dialect A more than said dialect resembles Prakrit dialect B? It is not necessary to refute Dr Michelson's items one by one, my aim being rather to point out the general spirit of the criticism. They are either of the trivial nature already illustrated,

rest on incomplete analysis of the facts, or, at best, can not be justly held to outweigh in a problem of this kind the mass of positive morphologic evidence I have given. Curiously enough, some of the shots fired are merely blanks. In no. 2 we read: "Nouns are not classified as animate and inanimate, nor are singular and plural distinguished"; in no. 3: "The verbal pronouns do not distinguish animate and inanimate third persons"; in no. 4: "The subject and objective verbal pronouns of the third person do not distinguish between singular and plural"; in no. 10: "In demonstrative and interrogative pronouns, neither animate and inanimate nor singular and plural are distinguished"; in no. 12: "The possessive pronoun of the third person does not distinguish singular and plural." In these five distinct items I discover only two independent statements (one of them, as we shall see below, highly questionable)! When a man pops out the same argument under several disguises, we suspect that he is short of ammunition.

Dr Michelson himself seems to have had a lurking feeling that an abundant use of negative evidence might be dangerous, for he states: "It is perfectly true that many of the above objections are negative, that is, that thus far the phenomena listed have not been reported. It is possible that further investigation may reveal some of them, but it is not likely that a skilled investigator like Dr Kroeber would have overlooked the majority of them." We are all of course delighted to be able to second Dr Michelson's flattering estimate of an esteemed colleague, but when "so careful and able a scholar" as myself is confronted in the wash with the charge of "utter folly," we learn to temper our admiration with prudence. What Dr Kroeber himself states, in a letter recently received from him, in regard to his Yurok material is this: "I have made no serious attempt to analyze the [text] material, contenting myself for the present with pointing out certain features which came to the surface of themselves." In regard to the Wiyot data, Dr Kroeber remarks: "I do not consider the texts very good, nor did I find any satisfactory informant in the time at my disposal. The whole sketch is avowedly a slim preliminary treatment." Under these circumstances it is evident that whoever builds on the non-occurrence of features in Yurok and Wiyot does so at his own risk. As a matter of fact, any one that has had experience in working out in the field the morphology of a language about which absolutely nothing is known to start with realizes that it is perfectly possible to fail to seize many fundamental features for quite a long time. I could give some striking examples from my own experience, did I not fear to lengthen this reply inordinately.

Dr Michelson's use of negative evidence is double. He does not, in the first place, allow adequately for the fragmentary character of our Yurok and Wiyot data. In the second place, it is dangerous to build on negative evidence even if we know for certain that a specific feature is lacking. The history of language shows nothing more clearly than the ease with which grammatical features gradually lose in complexity, often to the point of entire disappearance. What has become of the elaborate Indogermanic case system in French, or of the old complex system of personal endings in English? I maintain that one really striking morphological parallel or half a dozen lexical resemblances buttressed by consistently working phonetic laws (and why does Dr Michelson not occupy himself in his criticism with the phonological material that I have assembled?) are worth a good many points of divergence (of the same "weight").

One negative argument employed by Dr Michelson is so amusing that I must beg leave to comment on it. I had pointed out that Yurok in its adjectives distinguishes between animate and inanimate and drew the obvious parallel with Algonkin, venturing to suggest that other examples of the classification probably would be found in Yurok. Instead of rightly evaluating a striking positive resemblance, Dr Michelson makes capital out of a doubtful negative and cheerfully lists as one of his eight Yurok un-Algonkin features: "Nouns are not classified as animate and inanimate." In other words, "white" is in Yurok associated with animate or inanimate not insofar as whiteness is predicated of an animate or inanimate object but by virtue of some transcendental difference between animate whiteness as such and inanimate whiteness as such. I am afraid that neither the Yurok Indians nor myself feel at home in this highly rarefied philosophic atmosphere.

The one valuable element, I now hasten to add, in Dr Michelson's criticism is his treatment of some of the verbal pronominal suffixes of Wiyot and Yurok that I had compared with Algonkin suffixes. I freely admit that he has made it very plausible that Yurok *-m* 'thou' is not to be compared with Ojibwa *-m(wa)* 'ye,' and that reasonable doubt has been cast on the validity of one or two others of my verbal pronominal parallels. Such corrections must, in the nature of things, be expected and thankfully accepted.

In this reply I have tried merely to point out the serious methodological weakness of Dr Michelson's criticism. No attempt is here made to discuss the evidence for my thesis. For that the reader is referred to the article itself. Let us hope that further Wiyot and Yurok data

will be made available before long, so that more light may be thrown on an interesting and important problem. In concluding I should like to suggest to Dr Michelson that he go through the evidence again in a somewhat more liberal spirit. Perhaps it would be borne in on him that the sum total of lexical and positive morphological resemblances is not so unimpressive after all.

E. SAPIR

Rejoinder

IT does not seem to me that Dr Sapir has met my point, that it is possible or probable that in his Wiyot, Yurok, and Algonquian word-list, corresponding morphological elements are not being compared. If they are not, the list *per se* has little value.

As to the lack of perspective in linguistic comparison: In the case of Indo-European languages we have historic proof that certain members of the stock have diverged greatly from the original type. The question arises as to whether we have a right to generalize from this, and apply the principle to American Indian languages. I do not think so. As Professor Boas pointed out at the recent meeting of the American Anthropological Association, there are other possibilities to be considered.

If the published accounts of Wiyot and Yurok are merely fragmentary, *per se* there is no more reason to expect that the new evidence will reveal Algonquian traits rather than un-Algonquian ones. But the point I emphasize is that the *existing* evidence does not justify the genetic connection of Wiyot and Yurok with the Algonquian stock. (See page 56 of the *Report of the Secretary of the Smithsonian Institution*, 1914.)

Exactly as Dr Sapir thinks, I over-value the worth of negative evidence, so I think he underestimates it.

Regarding cumulative evidence. I might say that my statement, "Now it is perfectly conceivable that a divergent Algonquian language might possess a few of the un-Algonquian traits mentioned above, but it is incredible that any Algonquian language possesses all of them *en masse*," shows that I have "an inkling" of what it is. Dr Sapir has not answered the point raised in my original article. He lays special emphasis on the Yurok pronouns *n-* 'my', *k-* 'thy', *o-* 'his', *m-* 'somebody's'; and insists that they be treated as $a+b+c+d$, and not as a, b, c, d. Apparently he has not noticed that similar associations occur between Yurok and Wiyot on the one hand and some non-Algonquian languages on the other. For example, Chinook *n-* 'I' (verbal pronoun), Yurok *ne-* 'my'; Chinook *naika*, Yurok *nek* 'I' (independent pronoun); Chinook *m-*, Yurok *-m* 'thou' (verbal pronoun); Yurok and Molala *-k*

'I' (verbal), Yurok *qe-* 'thy', Molala *k·ī'ⁱ* 'thou' (independent pronoun); Karok *na* 'I' (independent), *ni-* 'I' (verbal), *īm* 'thou' (independent), *mi-* 'thy', *u-* 'he', 'she' (verbal), Yurok *ne-* 'my', *-m* 'thou' (verbal), *o-* 'his, her'; Takelma *gīⁱ* 'I' (independent), *ma* 'thou' (independent), Salinan *ke* 'I' (independent), *mo* 'thou' (independent), Costanoan (Monterey) *ka* 'I', 'my', *me* 'thou,' 'thy', Yurok *-k* 'I', *-m* 'thou' (both verbal); Shoshoni *nū-* 'my', *ūm-* 'thy', *u-* 'his', 'her', Yurok *ne-* 'my', *-m* 'thou' (verbal), *o-* 'his', 'her'. So that it does not appear to me that this association works wholly one way.[1]

If Dr Sapir will look over my discussion again he will see that I have not been "discreetly silent" regarding Wiyot and Yurok *m-* 'somebody's'. I pointed out a casual resemblance to Hupa *m-*, admitting that the usage was not the same.

Dr Sapir admits that I have made "it very plausible that Yurok *-m* 'thou' is not to be compared with Ojiibwa *-m(wa)* 'ye', and that reasonable doubt has been cast on the validity of one or two others of my [Dr Sapir's] verbal pronominal parallels." It certainly would be of scientific interest for him to have stated just which these are. For my own part I think I have not only refuted the *m* comparison, but four others as well; "cast reasonable doubt" on that of *wa* of Wiyot *kiluwa* 'you' with Ojibwa *ki—wa* 'your'; and to have shown that the comparison of Wiyot *hu-* with Fox *u-* may not be so certain after all, as Wiyot *hu-* occurs in the first person plural as well as in the third person. I regret that Dr Sapir has not seen fit to combat my reasoning in any of these cases. I have not "sedulously avoided" challenging certain "really convincing *positive* points" in his paper unless he acknowledges the pronouns under discussion are not convincing.

I have examined Dr Sapir's word-list again, and am even farther from being convinced by it than when I first read it. Dr Sapir has noted that several Algonquian secondary stems seem to be cognate with Wiyot primary stems. He cites Ojibwa *nin gābaw* 'I stand' (from Baraga) to show that even Algonquian dialects may differ from one another in this respect. I can not confirm this: in all Ojibwa dialects of which I have any independent knowledge, *gābaw* can not occur initially. That Dr Sapir can not be held responsible for the error, I freely grant; but the proposition to equate primary with secondary stems does not seem to me to be legitimate.

It should be noted that the comparison of Wiyot *me-weriL* 'flesh', 'fat' with Ojibwa *winin* 'fat', Natick *wēēs*, *weis* 'fat', Micmac *weoo'ɜ*

[1] I take the opportunity to state that my comparison of Miwok *-tok*, Wiyot *-itak*, is a mistaken one.

'flesh', Cree *wiyās* 'flesh', can not stand. The ordinary phonetic laws bar the comparison of all the Algonquian words: the Ojibwa word can have nothing to do with the others; cf. also Kickapoo *wīnenwi* 'fat', *wīyāθi* 'flesh'. Similarly Fox *uwīw(i)* 'to marry' and Ojibwa *widige* 'to be married' cannot be associated (see *Jour. Washington Acad. Sciences*, IV, p. 404). For a similar error see the comparisons under Wiyot *wet* 'satisfied'. There are some Wiyot-Yurok comparisons, such as Wiyot *hekw* 'snow' with Cheyenne *hístäs* 'snow', Yurok *rokw* 'wind' with Ojibwa *nōdin* 'wind', Cree *yōtin* 'wind blows', and Wiyot *wayit* 'to bend' with Ojibwa *wāgina* 'to bend', Cree *wākisiw* 'he is bent', which do not conform to the phonetic laws laid down by Dr Sapir. Certain Wiyot comparisons involve the assumption of prefixes in the nouns of that language, against which see Kroeber in *University of California Publications in American Archæology and Ethnology*, vol. IX. Under the circumstances it would have been better to leave out such comparisons. Wiyot *tem* 'to sit' is compared with Delaware *lúm'ᵉt'-api-* 'to be seated'. I can not analyze the first part of the latter term, but the last part suggests comparison with Fox, etc., *ᴀpi-* 'be seated'. Though perhaps not germane to the subject, I should like to point out that Cree *-n* of the first and second persons singular indicative is not identical with the *-n* of the third person inanimate indicative of intransitive verbs: in Fox in the first case there is no correspondent, e. g. *-si*; in the second *-enwᵏ*, in which *-en-* is a secondary connective stem, and *-wᵏ* the inanimate termination lost phonetically in Cree. I have not listed here all comparisons to which exception might be taken; but I may add the number of positive errors that *at present* can be demonstrated as such, is below the fifty percent allowed by Dr Sapir.

A word on Dr Sapir's criticism of my list of the un-Algonquian morphological features of Wiyot. He has suppressed the second part of No. 3—"nor are the exclusive and inclusive first persons plural distinguished." So there are more than "only two independent statements" in Nos. 2, 3, 4, 10, 12; nor is "one of them" "highly questionable." Dr Kroeber has not pointed out that in *Wiyot* animate and inanimate third persons are distinguished, even if he has pointed out that in *Yurok* certain adjectives apparently do make such a distinction. *Yurok* and *Wiyot* are not the same. That Dr Sapir's remarks apply to the *Wiyot* and not the *Yurok* list is shown by the numbers attached to the quotations. As to the distinction made in Yurok regarding adjectives, I think there is need of further material before this point can be elucidated.

As to the point raised by Dr Sapir with respect to vocalic change in participials, it is sufficient to refer to what I have said, namely, "Now it

is perfectly conceivable that a divergent Algonquian language might possess a few of the un-Algonquian traits mentioned above." I am by no means satisfied that vocalic change in the participial is lacking in Natick, though I have not sufficient material at hand to demonstrate it absolutely. Lest the reader think from Dr Sapir's language that the change is confined to Fox, Cree, and Ojibwa, I may assure him that it is found in several other Algonquian dialects.

If most of the list of un-Algonquian traits of Wiyot are "trivial," it surely would have been easy for Dr Sapir to refute them one by one, which he has not done.

At the time at my disposal (I saw Dr Sapir's article in galley proof only) it is not possible for me to make so long a list of words that resemble one another in Algonquian and in other languages than Yurok and Wiyot as Dr Sapir has made of Yurok, Wiyot, and Algonquian; at the same time the following will indicate that such a list probably could be made with sufficient time, even if an "onerous task."

YUKI	ALGONQUIAN
kan, talk	Fox, *kan-*, *kanō-*, talk
mi, drink	Fox, *meno-*, drink
muy, futuere	Fox, *mᴀ*, futuere
na^{m}w, see	Fox, *nāw-* (really *nā-*), see
pan, fall, stumble	Fox, *panᴀ-*, fail, miss[1]
tas, snare, trap	Fox, *tes-*, snare, trap
pok, burst	Fox, *pō'k-*, break
tuk, strike	Cree, *takiskawew*, strikes him with the foot

YOKUTS	ALGONQUIAN
na, I (verbal)	Fox, *ne-* (verbal), I
nān, we (pl. excl.)	Cree (Fort Totten), *-nān*, we (excl.)
yiuwin, wife	Fox, *uwīwᴀni*, his wife
ponpon, snow	Fox, *pepōn*[6], winter
met', large	Ojibwa, *mitchā*, it is large
bok, find	Fox, *me'k-*, find
padu, enter	Fox, *pāti-*, enter
wid, say, tell	Fox, *wīt-*, tell
dapi, pick, gather	Fox, (ᴀ)*tāp-*, pick up

I maintain that these random Yuki and Yokuts words resemble Algonquian ones fully as closely as do the most striking Yurok and Wiyot words of Dr Sapir's list. Would Dr Sapir conclude from the Yuki and

[1]Cf. *panaiakani*, 'you must have let it fall astray,' Jones, 230.11.

Yokuts list that Yuki and Yokuts are Algonquian languages, even if their morphology is fundamentally un-Algonquian, so long as we have a trifle more than "half a dozen lexical resemblances" and "one really striking morphological parallel" in that Yokuts and Algonquian distinguish the exclusive and inclusive first person plural?

TRUMAN MICHELSON

Epilogue

DR MICHELSON evidently dies hard. His "rejoinder" to my reply contains quite a number of statements that I would have something to say about, did I not feel convinced that the reader is as sick of this fruitless squabble as I am. I shall therefore let the real reply to both Dr Michelson's "rejoinder" and original criticism consist of a reference to my article on "Wiyot and Yurok, Algonkin Languages of California." I prefer to have the reader form his opinion of the merits of the case from the article itself than from either the article as interpreted by Dr Michelson or as explained by myself. For further criticism, I shall confine myself to expressing regret at the second paragraph of Dr Michelson's "rejoinder," as it makes capital of certain opinions which (whether justifiable in themselves or not is another matter) are not at hand for the reader to refer to.

E. SAPIR

A NOTE ON KINSHIP TERMS COMPOUNDED WITH THE POSTFIX *'E* IN THE HANO DIALECT OF TEWA

IN discussing the kinship terms of the New Mexican Tewa, Mr J. P. Harrington and Dr E. Sapir[1] have called attention to the formation of reciprocal terms by adding the suffix *'e* (which is ordinarily postfixed to nouns to form diminutives such as *musa'e*, 'little cat,' *kege'e*, 'little house,' and also used as an independent noun meaning 'child,' 'offspring') to express the relation of junior to senior relatives. In the Hano dialect[2] there are nine such pairs of terms:

SENIOR	JUNIOR
I. *Mæmæ*, mother's brother, etc.	*mæmæ'e*, man's sister's child.
II. *Ko'o*, mother's sister, etc.	*ko'o'e*, woman's sister's child.
III. *Ka'je*, mother's elder sister, etc.	*ka'je'e*, woman's younger sister's child.

[1] J. P. Harrington, Tewa Relationship Terms, *Amer. Anthr.*, N.S., 14, 1912, 472–498; E. Sapir, A Note on Reciprocal Terms of Relationship in America, *Amer. Anthr.*, N.S., 15, 1913, 132–138.

[2] See B. Freire-Marreco, Tewa Kinship Terms from the Pueblo of Hano, Arizona, *Amer. Anthr.*, N.S., 16, 1914, 269–287.

	SENIOR	JUNIOR
IV.	*Sa'ja*, mother's mother, etc.	*sa'ja'e*, woman's daughter's child.
V.	*Papa*, mother's mother's mother, mother's mother's father, mother's mother's brother.	*papa'e*, daughter's daughter's child; man's sister's daughter's child.
VI.	*P'epe*, mother's mother's brother.	*p'epe'e*, *papa'e*, *pe'ᵊe*, man's sister's daughter's child.
VII.	*Kuku*, father's mother.	*ku'e*, woman's son's child.
VIII.	*T'ele*, mother's father, etc.	*t'ele'e*, man's daughter's child, etc.
IX.	*Tuɬuⁿɳ*, father's brother.	*tɬɳ'e*, man's brother's child.

Dr Sapir conjectures "that originally the two members of a reciprocally related pair of individuals were referred to by exactly the same term, as in . . . the Takelma examples cited" [where *wi-gamdi* means 'my paternal grandparent' and also 'my son's child'] . . . but that the tendency to use the diminutive element with such terms [to indicate youth or affection] led to a specialization of usage." (p. 136.) Mr Harrington suggests a different explanation, namely, that in the formation of these pairs of terms the initiative, so to speak, is taken by the junior relative, so that the corresponding diminutive form represents a response on the part of the senior. "It is interesting," he writes, "to compare such English usages as when a child says: 'Auntie!' and its aunt answers, 'O you dear Auntie's child!' Thus, also, in Tewa: *ko'o*, 'Aunt!'—response: '*ɰᵘko'o'e*, 'You nephew or niece.' " (p. 473.)

In support of the view that the titles of junior relatives, in these senior-and-junior terms with postpounded *'e*, are not secondary modifications of reciprocal terms which were originally identical, it may be noted that a quite unusual proportion of all the Tewa names for senior relatives appear to belong to the class of "baby names."[1] They consist, that is, of reduplications of easily articulated sounds, *ba*, *da*, *ga*, *ma*, and so on, some of which find a place in the kinship terms of almost every language, because, uttered as they are at random by very young children, they are welcomed and appropriated by the older members of the home circle as evidences of recognition and attempts at significant speech.[2]

[1] See E. B. Tylor, *Primitive Culture*, chap. VI; J. C. E. Buschmann, "Ueber den Naturlaut," Berlin, 1853, transl. *Proc. Philological Soc. London*, vol. 6.

[2] Mrs C. B. Hodson, F.L.S., has been kind enough to procure the following notes on the first sounds uttered by an infant, the child of French and English parents, born in England: At about two months old he said "ae"; at six months "de de da"; fifteen days later, "dadad," and occasionally "dádi." At one year he could say

Thus the Hano-Tewa *tada*, 'mother's husband, father, father's brother, father's clansman' (Rio Grande Tewa *taɹa*, *tata*) may be classed with English *dada* 'father,' Hindustani *dada* 'nurse,' Georgian *déda* 'mother,' Welsh *tâd* 'father,' Spanish, popular Latin, Bantu, Eskimo,[1] Minnitaree[1] *tata* 'father,' Kickapoo[1] and Slave Lake Indian[1] *thäthā* 'elder brother' and 'mother's brother,' Slave Lake Indian[1] *tā* 'father,' English *ta* 'thanks,' English *tata* 'goodbye,' 'go' Italian for *dede* 'play,' and so forth.

Papa, 'mother's mother's mother' 'mother's mother's brother,' and (?) 'mother's mother's father' (San Ildefonso Tewa *papa* 'great-grandfather'), corresponds with English, French, Spanish, popular Latin, Caroline Islanders *papa* 'father,' Laguna[1] *pāpā* 'grandmother,' Kootenay[1] *päpa* 'grandparent,' 'granddaughter,' Australian[2] *pappi* 'father' and *pappa* 'young one,' Tule and Tabasco *păp* 'father,' Chibcha[3] *pābā* 'father,' Servian *baba* 'grandmother,' Hindustani *baba* 'father,' *babu*, 'child, prince,' English *pap* 'food,' popular Latin *papas* 'drink,' *papas* 'nurse-father,' *pappus* 'old man,' Italian *bobo* 'drink,' Santa Clara Tewa *paba* 'bread.'

T'ele, 'mother's mother's husband,' 'mother's father,' 'mother's father's clansman,' 'father's father' (New Mexican Tewa *t'ete*), and *p'epe*, 'mother's mother's brother' (not found in New Mexican Tewa), are very possibly the baby-names *tata* and *papa* modified, by the regular Tewa device of aspiration, to mark a distinction between the mother's husband and the mother's mother's husband, the mother's mother's father and the mother's mother's brother. An informant at Hano explained *p'epe* as "the same as *papa*," and the common diminutive *papa'e* confirms this.

Tuɬɻ'ᵊη, 'father's own brother' (New Mexican Tewa *tɻ'ᵊnɻ*, 'father's brother,' Santa Clara and Nambe; 'father's or mother's brother,' San Ildefonso) seems to be another specialized form of *tata*.

"maman"; at fourteen months he began to attach a meaning to certain sounds, using "da" or "din" for "donne" and "tiens." At fifteen months he said "papa," and "à bule" (for ça brule), and frequently repeated "déradéra." At sixteen months he began to repeat words which his parents tried to teach him. At his present age of twenty-two months he makes almost daily progress, but shows some preference for reduplicated sounds, e. g. "baba" for "boire."

[1] Morgan's tables.

[2] Tylor, loc. cit., tribe not specified.

[3] The irregular use (which Mr Harrington points out) of *mɋ'ᶜmɋ* and *mɋ'ᶜmɋ'e* in New Mexican Tewa, I take to be part of a general break-down of kinship terms connected with the change from matrilinear to patrilinear reckoning and the decay of clan consciousness.

Mæmæ, 'mother's brother,' 'elder clansman' (New Mexican Tewa *mæ'^{q}mæ^{s}*) is to be classed with the almost universal *mam*, *mama*, 'mother,' 'breast,' 'suck,' of European languages, Tahkali, Tlatskanai, and Georgian *máma*, 'father,' Kocch *mama* 'uncle,' Tamil and Telegu *mama*, 'mother's brother.'

Pi̧pi, 'elder brother' (not found in New Mexican Tewa), is comparable with Hindustani *bibi* 'nurse,' Swahili *bibi* 'aunt,' Australian[1] *bee-bee* 'breast.'

Kaka, 'elder sister' (not found in New Mexican Tewa), is the meaningless *ga-ga* of English baby-speech.

Possibly *ka'je*, 'mother's sister,' is a modification of a baby-word *ka*, and *tije*, 'younger brother or sister' of a baby-word *ti;* compare New Mexican Tewa *titi* 'doll,' 'baby,' and Lowland-Scottish *titty*, 'younger sister.' The baby-word *n—n—* (as in Tule *nan* and Spanish *nana* 'mother,' English *nana* 'nurse,' Blackfoot[1] *ninnah* 'father,' Greek *νεννος* 'uncle,' Milanese[1] *ninin* 'bed,' Italian[1] *ninnare* 'to rock the cradle') does not form any kinship term in the Hano dialect; and, as far as I know, it appears only in *nana* 'father's sister' in the Santa Clara Tewa.

At the present time, one constantly hears Tewa mothers teaching their infants to pronounce relationship terms. A mother holds up her baby to greet (say) her husband's mother, saying to it repeatedly "*kuk'ugi nq̧ tu̧!*" 'say *kuk'u!*'; and, if the child complies, or even before it does so intelligibly, the elder relative never fails to respond with enthusiasm, "*hǫ, nq̧bi ku'e!*"—"yes, my little *ku!*"

If we are right in supposing that the first member in each of these pairs of reciprocal terms (except in *saja—saja'e*) is a baby-word, more or less modified, then some such process as this must have brought about in the past the standardization of these terms. The first step in forming them must have been taken by the junior of the two relatives. The baby, stimulated by the sight of a friendly face, must be supposed to utter the sounds *mæ mæ* or *pa pa*, and the senior relative to respond *nq̧bi mæmæ'e!* 'my little *mæmæ!*' or *nq̧fi papa'e!* 'my little papa!' The child is encouraged to repeat these successful sounds, and a particular relative is pointed out to the child in connection with them. Later, under adult influence, the mother's mother's husband is distinguished from the mother's husband as a different kind of *tada*—a *t'e̊'e*. The suffix *'e* is essential to the reciprocal term.

[1] Tylor, loc. cit., tribe not specified.

These adaptations of baby-words as terms to express relationship are not without bearing, I think, on Professor Kroeber's contention[1] that modes of using terms of relationship are conditioned not by social causes but by causes purely linguistic and psychological. Undoubtedly such forms as *mama*, *papa*, *dada*, come into existence only because they are sounds which young children pronounce easily and therefore frequently and distinctly, and they become kinship terms only because they are appropriated as such by adult relatives; and to this extent they are "determined primarily by linguistic factors." But the assignment of these words in various languages as names to particular relatives and classes of relatives is another matter. The few examples quoted in this paper are enough to dispose of any "purely psychological" explanation.

As Tylor suggested forty years ago,[2] if *mama* in one language means 'mother' and 'breast' and in another 'uncle,' and *tata* means 'father' in one language and in another 'good-bye,' the application can scarcely be determined by "inherent expressiveness." It is plainly a question of household familiarity—of residence; the easiest and earliest baby-words are appropriated to the relatives who see the baby most often. In other words, the usage is determined by social causes. For example, in the European "family" system,[3] based on the father-mother-and-child home, the easy labial forms m—m and p—p are appropriated to the child's own mother and father: 'Chiamo papa à chi me da pane.' And, in European family life, what does an infant know of its mother's mother's brother or even of its mother's brother? But in the "clan" system of the Hano-Tewa, based on the home-life of a matrilinear clan household with matrilocal marriage, it is not surprising that the easy labial forms *papa* and *mąmą* should be assigned to important members of the mother's clan.

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LINGUAL CONSONANTS IN INDIA AND NORWAY

STUDENTS of philology and phonetics recognize a class of consonants in the languages of India called variously linguals, cacuminals, or cerebrals. The last designation is a mistranslation of the Sanskrit *mūrdhanya*

[1] *Journ. Roy. Anthr. Inst. Gt. Brit.*, 1909, XXXIX, 77.

[2] Tylor, op. cit.

[3] Dr Rivers (*Kinship and Social Organisation*, 1914, pp. 71, 82) suggests a three-fold division into "family," "kindred" and "clan" systems in place of the two-fold division into "descriptive" and "classificatory."

(literally, 'head sounds'), "thoughtlessly repeated by many Sanskrit scholars," to quote Max Müller, "and retained by others on the strange ground that the mistake is too absurd to mislead anybody" (*Science of Language*, London, 1899, II, p. 157). These sounds are uttered with the tip of the tongue turned up and drawn back so that the lower surface is brought against the dome of the palate. Such are the Sanskrit *ṭ*, *ṭh*, *ḍ*, *ḍh*, and *ṇ*. This type of consonants is peculiar to the languages of India, at least they do not appear to be found in any Aryan or Indo-European language outside of India, with one exception. This exception is of special personal interest to the present writer, as it happens to be found in his ancestral speech, the rural dialect of the "east country" or interior of southeastern Norway. There occur lingual *d*, *t*, *n*, *r*, and *l*. These are popularly known as "thick l." Thus both of these lines of a popular saying have lingual terminations:

"Regner og skinner solen
Er det fineste veiret paa jorden."

(Literally, "Rains and shines the sun is the finest weather on the earth.")

Special study has been made of the origin and distribution of the lingual or cerebral consonants in India by the later Rev. L. O. Skrefsrud, head of the Scandinavian Mission to the Santals, who came from the "east country" of Norway, and therefore recognized in them familiar sounds of his native dialect. He was a scholar of distinguished attainments in both European and Asiatic languages, honored by English and Indian institutions and societies.

The Santals are a division of the Munda or Kols, also known as Kolarians, who form a distinct linguistic stock, though racially they appear to be of mixed origin. Negroid, Mongolian, and Caucasian characteristics are found among them, the last being the most prevalent. Tribes of Munda speech formed an element of the aboriginal population of India, before the arrival of the Aryan-speaking people. They were formerly spread over the plains of Bengal, but are now restricted to the hills and jungles between Upper and Lower Bengal, the Chota Nagpore plateau, and from the Ganges to about 18° N. lat. (see Keane, *Man Past and Present*, p. 558). The Santals give their name to the district of Santal Parganas. The prevalence of Caucasian physical traits among the Santals and kindred peoples indicates that extensive mixture has taken place between the aborigines and the Aryan immigrants, and there are also evidences of reciprocal cultural influences. Dr Skrefsrud holds that this aboriginal type of language has had great influence on Sanskrit

and its descendants, the Aryan languages of modern India. The lingual consonants, with which we are here concerned, are found also in Santāli, and it is the opinion of this authority that their presence in Sanskrit is the result of borrowing or imitation, that they were not originally Aryan phonetic elements (*Prædikener og Foredrag*, Minneapolis, 1896, pp. 143 sq.). Their occurrence in Norwegian dialect presents an interesting phonological problem. It need hardly be said that the writer is not endeavoring to lay the foundation for a theory of linguistic transmission between India and Norway, after the manner of the author who cited the presence of *ll* in a certain Old-world language as proof that the Mexican aborigines originated in that particular region of the Eastern Hemisphere.

It may be mentioned here that the excellent volume entitled *The Folklore of the Santal Parganas* (London, 1910), which bears on its cover and title-page the name of the English translator, Mr C. H. Bompas, of the Indian Civil Service, is a product of many years' painstaking and scholarly work by Dr Skrefsrud and his coadjutor and successor, the Rev. O. Bodding. A large part of the material contained in the book was previously published in Norwegian in this country and in Scandinavia.

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MINNEAPOLIS

SCIENCE NOTES FROM IRELAND

BY the death of Dr Patrick Weston Joyce at his home in Rathmines, County Dublin, on January 7, 1914, at the ripe age of nearly 87 years, Ireland loses one of her most devoted sons and her most profound interpreter since the passing of O'Donovan and O'Curry more than half a century ago. Doctor Joyce first saw the light in 1827 in the little village of Glenosheen ("Glen of Oisin"), County Limerick, almost under the shadow of the historic Galtees and in the center of a district where the old life and language were well kept up to within a recent period. Born under the Penal Laws, when education was proscribed and the schoolmaster outlawed, he lived to become, under the kindlier working of a more enlightened policy, a chief factor in the educational upbuilding of his native country. His first teaching was in the "hedge schools," sometimes in the open air under the shelter of a roadside hedge, but more often in the cabin kitchen of his mother, with the rest of the pupils, study and recitation going on amidst the noise and confusion of the household routine. The teacher himself might be a graduate of Paris or Salamanca. Wherever the class held, young Joyce was always a welcome part of it,

for he carried a fife, and, taught by his father, who was a lover of the old music, could "roll off jigs, reels, hornpipes, and song tunes without limit." When eighteen years of age, being already well grounded in the classics and natural sciences, he went to Dublin, successfully passed the required civil service examination, and was appointed a teacher of method in the Training College of the Commissioners for National Education. In 1874 he became principal in the same institution. One fruit of these years of experience is his *Handbook of School Management*, which was adopted as the official standard and went through twenty-five editions. Later he was appointed one of the commissioners for the translation and publication of the Brehon Law Code of ancient Ireland. In 1893 he retired from official duties to devote himself to his chosen field of Irish studies, for which he was thoroughly equipped by his intimate knowledge of the language, history, music, and customs of the country. Among his more important works, most of which have passed through several editions and revisions, are: *A Social History of Ancient Ireland*, in two volumes, a work of immense research and based in part upon O'Curry's *Manners and Customs; The Story of Ancient Irish Civilization; A Concise History of Ireland; Origin and History of Irish Names of Places*, in two volumes, another work of great research and value: *Old Celtic Romances; A Grammar of the Irish Language; A Handbook of School Management; Ancient Irish Music; Old Irish Folk Music and Songs* (1909), containing more than eight hundred old airs and songs hitherto unpublished. His latest work, *English as we Speak it in Ireland*, a masterly analysis of the Anglo-Irish dialect, appeared in 1911. He also edited the *Ballads of Irish Chivalry*, of his gifted brother, Robert Dwyer Joyce, author of Deirdre, Blanid, and other poems of the old heroic period. Doctor Joyce was an M.A. and LL.D of Trinity College, member and councilor of the Royal Irish Academy, member and president (1909) of the Royal Society of Antiquaries of Ireland, member of the consultative committee of the Irish Texts Society, and active worker in the Gaelic League, particularly in the popularizing of the old native music, in which he found his chief delight. He was a man of lovable personality and stood for all that was best of his race and country.

THE archeological collection of W. J. Knowles, Esq., of Ballymena, County Antrim, the finest private collection in Ireland, has been catalogued and offered for sale by the owner. Mr Knowles is recognized as the dean in Irish archeology, and for more than half a century has devoted all his leisure and a considerable part of his resources to the exploration of the mounds, souterraines, and sand-dunes of the northern and western

coasts of Ireland, the results appearing in various publications of the Royal Irish Academy. Being now 83 years of age and no longer able to prosecute active field research, he has decided to dispose of the collection, which has already served its first study purpose. Exclusive of arrowpoints, it comprises some 40,000 stone implements of the Neolithic period, many of which are unique and without duplicate in any museum. It is also very rich in artifacts of the early and later Bronze periods. Mr Knowles has prepared an illustrated catalogue, in which work he was ably assisted by his talented daughters, Miss Margaret Knowles, the artist, and Miss Matilda C. Knowles, of the National Museum in Dublin. The collection is valued at £6000. Offers have already been made for portions of it, but the owner desires to sell it intact if possible, and to keep it in the country. It may interest readers on this side of the water to know that Ballymena was the home of James Adair, trader among the Southern tribes prior to the Revolution, and author of the noted *History of the American Indians* (London, 1775).

An important contribution to our knowledge of early civilizations in the north of Europe is *The Bronze Age in Ireland*, recently issued by Hodges, Figgis & Co., Dublin. The author, Professor George Coffey, T.C., M.R.I.A., holds the position of Keeper of Irish Antiquities in the National Museum of Ireland, and is already known for his studies of Keltic antiquities of the early Christian period, his monograph on the great chambered mound of New Grange, and his researches concerning the Cretan and Ægean influences in western Europe. The work deals also with the prehistoric gold art in Ireland.

Under the editorship of Professor Carl Marstrander, M.R.I.A., professor of Keltic philology in the University of Kristiania, the Royal Irish Academy has undertaken the publication of a monumental source "Dictionary of the Irish Language," based mainly on Old and Middle Irish manuscript materials from the earliest literary period to about the close of the sixteenth century, and embodying all of Professor Kuno Meyer's "Contributions to Irish Lexicography." The primary purpose of the work is to furnish a key to the study of the ancient manuscripts. We quote from the prospectus issued by the Council:

"The present work is on a much larger scale than that of the 'Contributions' of Professor Kuno Meyer, referred to. The aim of its editor, Professor Carl Marstrander, is to provide a thesaurus of the Irish language on historical principles, from the earliest times down to the modern Irish period, with copious citations illustrating not only the meanings of words, but also their grammatical inflexions and the changes they have

undergone in the course of centuries. The material upon which the work is based has been collected by the Academy during a number of years, and is derived from manuscripts and printed sources, covering almost every field of Irish literature. There exists at present no dictionary of these monuments of early Irish literature, which are, without such a key, inaccessible to all save the very few. Students have had to content themselves hitherto with the slender aid provided by glossaries to individual texts, quite inadequate for the purpose. The Dictionary when complete will fill three volumes of about 1000 pages each. . . . It will be issued in fasciculi, the price of which, to subscribers only, will be one shilling per sheet of 16 pages (2 columns each page), post free; or large paper edition, of which only 100 copies will be printed, one shilling and threepence per sheet. The first fasciculus, containing 112 pages, will thus cost subscribers 7s., or on large paper 8s. 9d. The price to non-subscribers will be 8s. 6d. and 10s. 6d. respectively.

In connection with the present activity in Gaelic studies Mr T. ONeill Lane of Tournafulla, County Limerick, one of the leading authorities upon the language, announces as nearly through the press his great *English-Irish Dictionary*, upon which he has been engaged for a number of years. The published volume will make nearly 1600 octavo pages, with material and illustrative examples drawn from every part of the country, and as a compendium of the spoken language of today will undoubtedly take first rank. The advance sheets have received the hearty endorsement of such distinguished Keltic scholars and philologists as Hyde, Meyer, Windisch, Rhys, Gaidoz, Pedersen, Dottin, and Van Hamel. In a personal letter the author states that he has devoted to the work a large part of twenty years, and all of his time for the last six years, and has spent upward of £2500 in getting the material. He adds: "I have endeavoured to make the Dictionary a national monument, and you will see by the enclosed comments of Celtic scholars of international repute that I have to a considerable extent succeeded in my aim, and at all events produced a book which will be an honour to our country and a valuable contribution to Indo-European philology as well as an important aid to all students of Irish."

JAMES MOONEY

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THE "RED-PAINT PEOPLE"—II

IN my article on the identity of the "Red-paint People" which appeared in this journal (vol. 15, 1913, pp. 707–710), I endeavored to make

my argument clear and concise, but in this I evidently failed as is shown by the wording of Mr Moorehead's reply (ibid., vol. 16, pp. 358–361).

The graves discovered by Mr Moorehead's party in Maine are of interest, but their origin is not a veiled mystery as he is striving to have all believe. This endeavor on his part is seemingly caused by his desire to discover the unusual, and his failure to consult the writings of others. He prefers to formulate his own opinions irrespective of known facts and conditions.

My argument is this: The graves discovered by Mr Moorehead on the coast of Maine differ in no respect from those rifled by the Pilgrims near the present Provincetown, November 11, 1620. These burials had been made in pits which could not be distinguished from those containing corn and other provisions. The bodies were in a good state of preservation, indicating recent burials. These were wrapped and bound, and the bundle thus formed contained "a great quantitie of fine and perfect red Powder." Many articles were found in or about the graves, including "Boules, Trayes, Dishes, and such like Trinkets." The material of which these were made is not specified, but they were probably fashioned of wood or of bark, as was the custom among the New England Indians. Therefore we have no mention of pottery vessels occurring in these graves, and it is interesting to know that lack of pottery among the Maine graves is given by Mr Moorehead as one of the characteristic features of these burials.

Although Mr Moorehead worked carefully, he was unable to discover the limits of many graves, but Mr Willoughby was more successful and was able to show them to be in the form of pits, from two to three feet in diameter and of about the same depth. Hence these correspond to the caches met with in the vicinity of many Indian villages, similar in every respect to those opened by the Pilgrims, some of which still contained corn and other stores, while others had been utilized as places of burial. Could we at the present time discover these graves, dating from the early years of the seventeenth century, they would present the same features as those occurring on the coast of Maine. All material of a perishable nature would have disappeared, only the "red paint" and implements remaining. These facts will be understood and acknowledged by all who are not seeking the weird and mysterious.

At present it is not known to what extent this form of burial was practised by the aborigines of New England, but finding it in several places in Maine, and having indisputable evidence of its having been followed by the inhabitants of Cape Cod, leads us to believe that similar

graves could be discovered at other points along the coast, and possible in the interior.

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THE "RED-PAINT PEOPLE"—II

IN the *American Anthropologist* for January–March, 1913, Prof. Warren K. Moorehead, in describing his archeological work in Maine, calls the makers of the graves investigated there by him, the "Red-paint People," and tells us that, excepting the strange remains of the cave people of the Ozark mountains (which also were investigated by him), perhaps nothing found in recent years in the United States is comparable in interest to the problem of the "Red-paint People."

When a claim implying so much is brought forward about some scientific discovery the assertion should, of course, be clearly substantiated in every particular, and all the more should this be done when one has allowed himself to make it in reference to his own work.

In the *American Anthropologist* for January–March, 1914, I pointed out how inappropriate it was to call the makers of these graves in Maine "the Red-paint People," and cited instances of the use of this red paint with burials, with which Professor Moorehead ought to be perfectly familiar.

In this journal for April–June, 1914, Professor Moorehead replies to my criticism, but fails to show, in my opinion, by what right the title "Red-paint People" was accorded by him to the makers of the Maine graves, inasmuch as the use of red paint with large numbers of burials, and often in great quantities, had been reported prior to his investigation. If Professor Moorehead thinks he has discovered a new culture in Maine, let him select a title for the people connected with it which shall be at least distinctive and not one that might be applied to a class of paleolithic burials, to many ancient burials in Europe and in this country, and to very numerous interments throughout a certain part of Florida, all of which had been reported prior to Professor Moorehead's archeological investigations in Maine.

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ANTHROPOLOGIC MISCELLANEA

Anthropology at the British Association.—The Australian meeting of 1914 will always occupy a prominent place in the annals of the British Association, if only on account of the interest attaching to the proceedings of its Anthropological Section. Not only did the representatives of this rapidly developing branch of science muster in full strength, but their discussions, bearing as they did largely on Australian problems which are concerned with the most primitive of existing human types, were throughout directed to fundamentals. Needless to say, the shadow of the great war raging in Europe cast a chill over the spirits of all concerned, and it needed a certain moral effort to carry through a program in which, at least as originally designed, business and pleasure claimed equal shares. As it was, the inclination of the balance toward the side of seriousness was not without its advantage for those students who found the allotted time all too short to enable them to cope with Australia's magnificent ethnological collections. These must be seen before one is in a position to assign to Australian culture its true place in the evolutionary scale.

In Western Australia certain anthropologists of the advance party got into touch with aboriginals, and again in South Australia Professor Stirling organized a most successful expedition of the whole section to Milang, where a large group of the Narrinyeri tribe were on view, so that everyone was presently hard at work, spurred on by the discovery that, even if degeneration has gone far, there still exists plenty of valuable lore to be garnered. It must be added that in the Adelaide Museum Professor Stirling has amassed wealth untold in the way of ethnological material, special value attaching to the spoils from the central deserts, illustrative as they are of the life of the now famous Arunta and their congeners. At Adelaide, too, Professor Sollas gave an evening lecture on prehistoric man, which delighted his large audience.

Formal proceedings opened at Melbourne on Friday, August 14, Prof. G. Elliot Smith leading off with a remarkable comparison of certain customs and inventions of the ancient Egyptians with those of primitive peoples of the Far East, the full development of his argument being unfortunately somewhat hampered by want of time. After Dr A. Low had described the finding of certain curious cists of the Bronze age in the

northeast of Scotland, the section adjourned to the museum. Here, first of all, Messrs A. S. Kenyon and D. J. Mahoney exhibited and explained a very rich series of aboriginal stone implements, extending from the well-polished adze at one end of the scale to the roughest Paleolithic and even Eolithic types at the other. Then Prof. Baldwin Spencer showed all manner of specimens of native handiwork, including a remarkable series of drawings on bark from the Alligator river, Northern Territory.

On Tuesday, August 18, Mr Balfour gave forth the results of his investigations into the remains of an early Stone age in South Africa. He was followed by Dr Marett, who, as chairman of the committee that has undertaken the recent excavation of a Mousterian cave habitation in Jersey, was able to report a rich harvest of discoveries. Prof. G. Elliot Smith and Prof. J. Symington then engaged in a discussion, scarcely less impassioned than it was profound, concerning the possibility of deducing the shape of the human brain from that of the inner surface of the cranial wall, with special reference to the primitive characters that have been attributed on these grounds to the Piltdown skull. Major A. J. N. Tremearne, who was returning next day to Europe on military duty, wound up the morning with a well-illustrated account of the Bori, or disease-spirit, ceremonies of certain Hausa colonies in North Africa. In the afternoon Prof. Felix von Luschan, of Berlin, delighted a large audience with a discourse dealing with the question, "Are we degenerate?' and embodying various more or less startling proposals of a practical nature in the interest of eugenics.

On Wednesday, August 19, the whole morning was devoted to a debate, initiated by Dr Rivers, on the subject, " Is Australian Culture Simple or Complex?" The section listened with the greatest interest to Dr Graebner, who holds strong views on this particular topic, and the ball was kept rolling by Professors Sollas, Berry, von Luschan, and Haddon, Rev. J. Mathew, Mr Balfour, Mr A. R. Brown, Dr Malinowski, Dr Marett, and others. The discussion as a whole was most profitable, though perhaps it raised more problems than it solved. It remains to add, in reference to proceedings in Victoria, that, besides enjoying unlimited facilities for study at the museum, and in Professor Berry's well-equipped department of anatomy, the anthropologists had the opportunity of visiting an aboriginal quarry at Fisherman's Bend, near Melbourne, and, again, of making further acquaintance with aboriginals, since the Colanderrk station near Healesville provides types from several parts of the continent, the older members of the native community pre-

serving considerable traces of their former culture, as witness their corrobborree songs which Professor von Luschan was careful to record by means of the phonograph.

Arrived at Sydney, the section on Friday, August 21, was treated by Sir Everard im Thurn to a presidential address which summed up in telling fashion his impressions of the character of the so-called "savage" in the shape of the primitive Fijian. He emphasized "the enormous, scarcely conceivable difference in habit of thought which separates the savage from the civilized man," and showed on the strength of his experience as an administrator that the process of mutual adjustment, so far as it is possible at all, must necessarily be slow, demanding, too, on our part much patience, good will, and anthropological science.[1] Dr Ashby followed with an account of various archeological discoveries of his own at Malta. Then a most sensational announcement was "sprung" on the meeting. It appears that, just about the time that the pioneers of the British Association were setting foot on Australian soil, a highly petrified skull was found on the Darling Downs, Queensland, such as may very well prove to be assignable to Pleistocene times, Pleistocene man in Australia having hitherto existed only in the sphere of pure hypothesis. Professors David and Wilson, who exhibited the specimen to the much-moved section, were careful to state the case for the attribution of a high antiquity to the specimen with the greatest caution, the chief argument, pending a full study of the anatomical characters, resting on the fact that the state of petrification which the skull displays corresponds closely to that observable in regard to the remains of Diprotodon and other extinct animals from the same district. The Reverend Doctor George Brown then read extracts from an interesting paper on Samoan folklore, which he has offered to *Folk-Lore* for publication.

On Tuesday, August 25, the morning session opened with a discussion, led by Dr Haddon, on the importance of the study of anthropology for the administrator. The president lent the weight of his great authority to the plea for a more thorough instruction of those who are set over natives in the mental habits and culture of their charges, and something was said by other speakers of what is being done by some of the British universities to provide an education in anthropology, both theoretical and applied. Dr Rivers next spoke of gerontocracy in its bearing on marriage in Australia, showing how the old men's tendency to appropriate all available wives has in certain cases left its mark on the per-

[1] Sir Everard im Thurn's presidential address appears in *Science*, New York, October 9, 1914.

manent structure of society. Mr A. R. Brown followed with an account of the varieties of totemism in Australia, his classification covering several new types recently discovered by himself in Northern Territory, or by Mrs Bates in the Eucla district. In the afternoon the section repaired to the museum, where local experts provided a full program. Mr R. Etheridge commented on various ethnological exhibits from Australia and New Guinea, being part of the rich collection over which he presides. Mr S. A. Smith dealt with various anatomical peculiarities of the Australian aborigines. Messrs Flashman, Hedley, Enright, and Elmore were also to thank for interesting contributions and exhibits, while a great debt is due to Prof. J. T. Wilson, who, despite the severe duties of military censor, managed to arrange for so strongly supported and well-organized a sectional meeting as that of the anthropologists at Sydney.

It has proved quite impossible to do justice here to the multitudinous experiences which, altogether apart from the formal proceedings of the section, have served to make the Australian visit of the Association, and of the anthropologists in particular, at once pleasant and profitable in a quite unique way. The unfailing kindness and hospitality shown by our over-seas brethren one and all make it a too invidious task to assign special thanks, and it must suffice, by way of showing due gratitude, to see to it that, in the way of science, Australia's myriad wonders and excellences are henceforth rated at their proper worth. As for the anthropologists in particular, they cannot be accused of having neglected Australia, since it has ever been the happy hunting-ground of the theorist seeking to reconstitute the life of primitive man; but at any rate it is likely that henceforth the study of Australian problems will proceed more intensively, inasmuch as the astonishing wealth of the Australian museums has been realized from near at hand. Moreover, we come away feeling that we have left on the spot plenty of men capable of carrying out the best kind of anthropological work, if only those in control of ways and means can be induced to make proper provision for a branch of study in which Australia might well aspire to lead the world.— *Nature*, London, October 22.

A Cheyenne Dictionary.—The veteran Mennonite missionary, Reverend Rodolphe Petter, who has spent twenty-three years with the Cheyenne of Oklahoma, and is without question the best authority on the language and general ethnology of the tribe, announces as nearly ready for publication his "English-Cheyenne Dictionary," a monumental work which has engaged much of his study time for a number of years. Mr

Petter is of Switzerland, the country which has given to American ethnology Gallatin, Gatschet, and Bandelier. After graduating in theology and receiving ordination at home, he volunteered for the Indian mission work, having as an equipment, besides a practical knowledge of agriculture and mechanics, a ready acquaintance with the classical languages, French, German, and medicine, to which he afterward added English on arriving in this country. In 1891 he was assigned to the Cheyenne mission at Cantonment, Oklahoma, where he has since resided until within the last year, being now on temporary furlough for the purpose of arranging his linguistic material. On coming to the tribe Mr Petter at once devoted himself to an earnest study of the language, which he mastered so thoroughly that for years he has used it entirely in all his communication with the Indians, both in church and in camp. His English also is nearly perfect, and he preaches as occasion demands in any one of four languages with almost equal fluency. A manuscript English-Cheyenne dictionary which he prepared some years ago has been several times laboriously duplicated for the use of other missionaries in the tribe, both in Oklahoma and Montana, and forms the basis of the present work. He has also published in the same language a *Cheyenne Reading Book* (1895), the first book ever published in Cheyenne; translations of the gospels of Luke and John; the *Pilgrim's Progress;* several compilations of hymns; and a considerable volume of extracts from the Old and New Testaments (*Hosz Maheo Heeszistoz*, 1913). His "Sketch of the Cheyenne Grammar" was published in Volume I of the *Memoirs of the American Anthropological Association* in 1907. He has also a Cheyenne-English Dictionary and a Cheyenne Grammar still in manuscript.

As originally planned, the present dictionary would make nearly 1000 printed pages of large size, in two volumes, and embodying, besides etymologies and definitions, a great amount of ethnologic material relating to botany, medicine, geography, ritual, and daily home life. The price is necessarily high, the edition being limited to about fifty copies, and the printing being done upon the Gammeter multigraph, by his son, Valdo Petter, who was born with the tribe and knows the language thoroughly. Should the work receive sufficient encouragement it will be followed by a Cheyenne-English Dictionary and a Cheyenne Grammar. Further information and specimen sheets may be obtained by addressing the author, Rev. Rodolphe Petter, Kettle Falls, Washington.

JAMES MOONEY

Philadelphia Meeting of the American Anthropological Association.—The annual meeting of the American Anthropological Association was held at the University Museum, Philadelphia, December 28–31, 1914, in affiliation with the American Folk-Lore Society and Section H of the American Association for the Advancement of Science. The attendance was satisfactory, and a rather extended program was presented. It was decided to hold a special session in San Francisco, August 2–7, 1915, and to empower Prof. A. L. Kroeber, of the University of California, to make all arrangements relating to the meeting. A decision as to the place of the next annual meeting was referred to the Executive Committee. The secretary of the Committee on Phonetics, Dr E. Sapir, read the committee's report in abstract, and the members were instructed to publish the entire report in whatever form seemed most appropriate. The following officers for 1915 were elected by acclamation: President: F. W. Hodge, Bureau of American Ethnology. Vice-President, 1915: Clark Wissler, American Museum of Natural History. Vice-President, 1916: A. L. Kroeber, University of California. Vice-President, 1917: George B. Gordon, University of Pennsylvania. Vice-President, 1918: Berthold Laufer, Field Museum, Chicago. Secretary: George Grant MacCurdy, Yale University. Treasurer: B. T. B. Hyde, New York City. Editor: Pliny E. Goddard, American Museum of Natural History. Associate Editors: J. R. Swanton, R. H. Lowie. Executive Committee: A. M. Tozzer, E. Sapir, J. Walter Fewkes.

Council: F. W. Putnam, F. Boas, W. H. Holmes, J. W. Fewkes, R. B. Dixon, F. W. Hodge, C. Wissler, A. L. Kroeber, G. B. Gordon, B. Laufer, G. G. MacCurdy, B. T. B. Hyde (ex-officio); A. E. Jenks, S. A. Barrett, W. Hough, A. Hrdlička, A. M. Tozzer, F. G. Speck, A. A. Goldenweiser, E. A. Hooton, A. V. Kidder, F. C. Cole (1915); Byron Cummings, G. H. Pepper, W. C. Farabee, J. R. Swanton, G. G. Heye, H. J. Spinden, T. T. Waterman, C. M. Barbeau, W. D. Wallis, A. B. Lewis, Stansbury Hagar (1916); W. C. Mills, H. Montgomery, C. B. Moore, W. K. Moorehead, C. Peabody, C. C. Willoughby, T. Michelson, A. B. Skinner, M. H. Saville (1917); A. C. Fletcher, C. P. Bowditch, S. Culin, R. H. Lowie, C. H. Hawes, E. Sapir, N. C. Nelson, H. Bingham, J. A. Mason, G. A. Dorsey, E. W. Gifford (1918).

"Pawnee," "Tatarrax," and "Harahey."—Information received from Mr James Murie, a member of the Pawnee tribe, sheds additional light on the derivation of these three names. After extended inquiry Mr Murie has reached the conclusion that the common tribal name

PAWNEE is from *Parés*ᵘ, signifying "hunters," and was the answer given by Pawnee when first asked by white people who they were. In this term the *r* is not pronounced as in English, but sounds like fused *r-d*, while the final vowel (ᵘ) is barely uttered. TATARRAX, it will be recalled, is mentioned by Gomara (Hist. Gen. Indies, cap. ccxiii, 1553) as the name of a chief of the province of Harahey, that lay beyond the province of Quivira, which latter has been identified as the country of the Wichita Indians in eastern central Kansas in the middle of the sixteenth century. Mr Murie states that Tatarrax is evidently intended for *Táturash*, meaning "I found it," sometimes shortened to *húrash*. A Skidi Pawnee bearing the same name died in Oklahoma after the tribe was removed thence from Nebraska in 1873–75. The name HARAHEY, asserts Mr Murie, is unquestionably derived from *Awáhi*, the name by which the Skidi are known to the Wichita. Indeed this derivation is the only reasonable one, since Coronado learned of the province of Harahey while among the Wichita (Quivira) Indians, consequently his chroniclers recorded the Wichita designation for the important Skidi branch of the Pawnee.

F. W. HODGE

The Berlin Music Archive.—One of the most important and interesting departments of the Berlin University Museum is the Phonogramm-Archiv, a collection of phonograph records of the music of primitive peoples in all parts of the world. The Archiv is in direct connection with the Psychological Institute and is under the able supervision of Dr Erich M. von Hornbostel, of international reputation in his specialty, assisted by Dr Otto Abraham. Dr von Hornbostel himself is originally of Vienna, where he established the first important work of the kind, the Phonogramm-Archivs-Kommission of the Imperial Academy of Sciences, now in charge of Dr Rudolf Poch, author of a valuable *Guide for Collectors of Phonograph Records*. The Berlin collection exceeds 5000 cylinders, representing hundred of tribes, particularly those of the German colonies and protectorates in Africa and the Far East, and including also a number of Indian records taken by Dr von Hornbostel while studying the Plains tribes some years ago. Bulletins and journal papers embodying the results of special studies are published from time to time, one of the latest, by Dr von Hornbostel, relating to the music of the Solomon islands, based on material of the Thurnwald South Sea Expedition, 1906–1909. He has also in contemplation monographs on the pan-pipes and xylophone, and on Chinese musical form. A series of lectures on music development is conducted for the University by Dr C. Stumpf, author of *The Beginnings of Music*.

JAMES MOONEY

William Nelson, lawyer and historian, died at Paroma., Mata, on August 10, after an illness of more than a year. He was born in Newark, N. J., February 10, 1847, received a public school education, and was given the degree of A. M. by Princeton in 1896. He engaged in journalism in Newark and Paterson for several years, was admitted to the bar, and practised law at Paterson since 1875. Mr Nelson was chairman of the Public Records Commission of New Jersey, secretary of the New Jersey Historical Society since 1880, and a member of several other historical and scientific organizations, including the American Anthropological Association, of which he was a founder. He was editor of the *New Jersey Archives*, and author of *The Indians of New Jersey*, *Personal Names of the Indians of New Jersey*, *History of the City of Paterson*, etc.

In the September number of *Folk-Lore* (London) Miss C. S. Burne continues her valuable studies of the geographical distribution of British folk-customs. In this paper she deals with the customs known as souling, clementing, and catterning, practised in parts of the western midlands in November. They exhibit an example of successive layers of imported custom superimposed on a foundation of indigenous custom. First come the ancient, almost prehistoric, autumnal celebrations of the Old and New Year, probably always combined with a Feast of the Dead. Then Christianity transforms the pagan feast into the festival of Hallowmass. Next we meet with that combination of newly introduced subsidiary cults with newly organized and specialized crafts, which marks the progress of civilization in the Middle Ages. Thus St Clement and St Catherine come into local prominence. Finally comes the period of decay, when the theological changes of the sixteenth century shatter the religious side of the kindly old customs, while simultaneously the centralizing despotism of succeeding centuries and a civilization growing more and more complicated deprive these rites, once so important, of any real significance, and they dwindle away or are kept up only by the most conservative part of the population, the children, wherever their elders allow them to benefit by them.— *Nature*.

Mr George G. Heye has added a number of specimens to his North American ethnological collection in the University Museum, Philadelphia. Some of these were obtained by him in Europe during a journey which he made in the summer of 1913. Among these objects are a fine old painted buffalo-hide war-shield protected by its deerskin cover. This is a first-rate example of the war-shield of the Plains Indians. A number of pieces of quillwork also deserve special mention, as well as several pairs of

leggings of the Naskapi Indians with characteristic decorations in fine style and workmanship. The Heye collections have further been enriched by a number of wampum belts which, added to those already on exhibition, make this collection of wampum now the largest and most notable in existence. Among the Indian tribes represented by these wampum belts are the Penobscot, the Passamaquoddy, the Micmac, the Ojibway, the Delawares, the Huron, and the Iroquois. Besides the belts which have historical association, having been identified with treaty obligations, there are a number of ornaments and strings of wampum, such as served for ceremonial use.

In the *Journal* of the Royal Society of Antiquaries of Ireland for September Mrs Brunicardi contributes an interesting summary of our existing knowledge of the shore-dwellers of ancient Ireland. The map shows the curious distribution of their kitchen-middens. They appear at only three sites on the east coast, while on the west and south they are fairly numerous, chiefly in Donegal, Galway, Clare, Kerry, and near the harbors of Cork and Waterford. The writer discusses these remains in great detail with references to the original authorities. Very little pottery and no evidence of the use of metal are found in them, and Mr Knowles regards them as among the earliest remains we possess of the Neolithic age. These shore-dwellers appear to have been a distinct race, probably a degraded one, living almost entirely on shell-fish, periodically migrating in search of food, but possessing what may be termed headquarters to which the whole tribe sometimes returned, and this they regarded as their home.

The University Museum of Philadelphia has announced the following lectures early in 1915: January 9, Roy Chapman Andrews, of the American Museum of Natural History, New York, "In the Wilderness of Northern Korea and Southern Manchuria." January 16, Professor A. V. Williams Jackson, of Columbia University, "Persian Art." January 23, Dr Esther B. Van Deman, Associate of the Carnegie Institution, "Roman Remains in Northern Africa." January 30, Prof. Charles C. Torrey, of Yale University, "Mohammedan Art." February 6, Prof. E. Washburn Hopkins, of Yale University, "Art of India." February 13, Prof. Frederick W. Williams, of Yale University, "Chinese Art."

The Sectional Committee of Section H of the American Association for the Advancement of Science recommended the names of twenty-eight members for fellowship, and the Council of that Association duly elected them. The recommendation of the Sectional Committee that George

M. Stratton, of the University of California, be elected Vice-President of the Section for the ensuing year, was likewise approved by the General Committee. Professor L. Witmer was elected a member of the Council: Dr P. E. Goddard a member of the General Committee; and Prof. F. Boas a member of the Sectional Committee to serve five years.

MR HARLAN I. SMITH, archeologist, of the Geological Surveyof Canada, is carrying on intensive exploration in the shell-heaps of Merigomish, Nova Scotia, where important results are anticipated, especially since the country lying around the Gulf of St Lawrence was formerly inhabited by no fewer than four totally different tribes. W. B. Nickerson is continuing explorations in the mounds, earthworks, and village sites of southwestern Manitoba, and W. J. Wintemberg is exploring a section of country between Prescott and Peterborough for a site of a culture different from that of the Roebuck site which he excavated in 1912.

As previously announced in this journal, CURRENT ANTHROPOLOGICAL LITERATURE ceased publication with Volume II, No. 4 (October–December, 1913). Members of the American Anthropological Association or of the American Folk-Lore Society would do well to examine their files of this periodical, and should any of the quarterly numbers be lacking, to make immediate application for the missing parts to the Editor of the Association, who will have the lacunæ filled without cost. To non-members of either of the organizations mentioned the price is twenty-five cents per number.

A VALUABLE collection of ethnological specimens has just been received by the University of Pennsylvania Museum from Dr William C. Farabee, who is at the head of the University's Amazon expedition. The specimens were collected in the southern part of British Guiana among the Carib and Arawak Indians and other hitherto unknown tribes. They include clothing for men and women, made from the feathers of the macaw and other birds of rich plumage, paintings of religious ceremonials on sticks, beadwork, bows and arrows, spears, hammocks, and domestic utensils.

THE NATIONAL ACADEMY OF SCIENCES is to publish a monthly journal of proceedings, commencing with the present year. The main purpose of the proceedings is to obtain the prompt publication and wide circulation of a comprehensive survey, in the form of brief original articles, of the more important scientific researches currently made by American investigators. The field of anthropology will be represented in the new publication by Mr W. H. Holmes.

THE AMERICAN MUSEUM OF NATURAL HISTORY has received from Messrs M. Guggenheim and Sons the gift of a small collection of prehistoric objects found in a copper mine at Chuquicamata, Chile. The collection consists chiefly of hafted stone hammers and wooden scrapers. These were the implements used by the Indians in pre-Spanish days in collecting the copper (atacamite) with which they made knives and other implements.

A REMARKABLE showing was made during the first weeks of the year at the University of Utah at Salt Lake City, where more than forty students were enrolled in the elementary course in American archeology, seven in the advanced course (given in 1914–15 for the first time), and more than twenty in the class for Greek archeology. The courses in archeology are given by Dean Byron Cummings.

DR ALBERT S. BICKMORE died at Nonquitt, Mass., on August 12, aged seventy-five years. Dr Bickmore rendered great aid to the American Museum of Natural History, New York, in obtaining its charter in 1869, from which time until 1884 he was its curator; subsequently he traveled many thousands of miles in the interest of the Museum, gathering large collections.

IN the course of 1914, Mr F. H. S. Knowles, formerly of Oxford University, England, was appointed permanent physical anthropologist of the Geological Survey of Canada. The Anthropological Division of the Geological Survey now comprises three sections, Ethnology (including Linguistics), Archeology, and Physical Anthropology.

AT the meeting of the San Francisco Society of the Archeological Institute of America held at the Art Institute, November 28, papers were read by Dr Thomas T. Waterman on The Social Organization of Ancient Tenochtitlan and by Dr A. L. Kroeber on The Problem of the Age of the American Race and Cultures.

DURING the week ending November 14, Professor George Grant MacCurdy lectured twice for the Pittsburgh Academy of Science and Art, once at Swarthmore College, and once for the Hartford Society of the Archeological Institute of America.

THE LIBRARY OF CONGRESS has enriched its collection of books relating to the native languages of North America by the purchase of 168 volumes of duplicates in the Edward E. Ayer collection.

THE HARVARD CORPORATION has appointed Arthur W. Carpenter, of Boston, to the Central American fellowship in archeology, with an income of $600 a year.

The American Folk-Lore Society reëlected Dr P. E. Goddard president and Prof. C. Peabody secretary, and elected Mr A. B. Skinner assistant secretary.

Dr Ferdinand Freiherr von Adrian-Werburg, former president of the Anthropologischen Gesellschaft in Wien, died April 14, 1914.

Dr Otto Finsch, the well-known ethnographer and geographer of Braunschweig, celebrated on August 8 his seventy-fifth birthday.

Dr J. Walter Fewkes, of the Bureau of American Ethnology, has been elected a member of the American Antiquarian Society.

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